PUBLIC HEALTH REPORTS

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FEDERAL SECURITY AGENCY • Public Health Service

...for the care of the mentally ill

New unit at Anoka State Hospital, Minnesota

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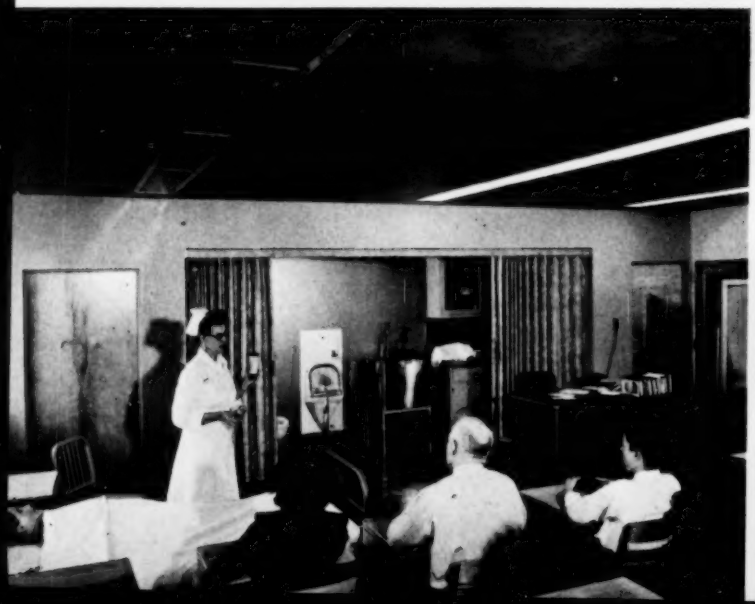

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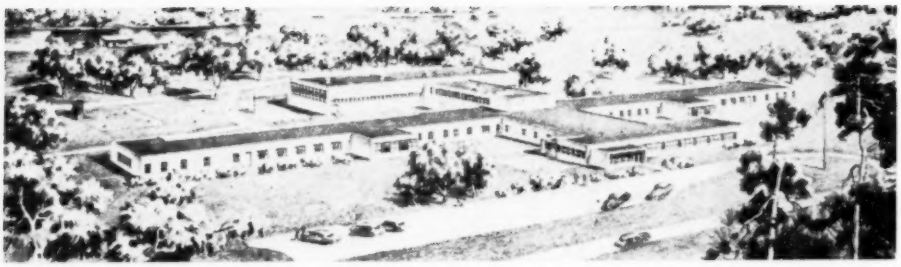

This new unit of Minnesota's Anoka State Mental Hospital (frontispiece and above) was designed to foster the recovery of mental patients by providing recreational and therapeutic facilities in homelike surroundings. Patient rooms are painted in warm colors; corridors and assembly rooms are walled with light-colored tile. Large wards are eliminated, with no more than four patients assigned to the larger rooms. There are also single and double rooms. The building includes complete facilities for treatment by insulin and electric shock and aquatic therapy.

Each bedroom wing of the new receiving unit has a central nurses' station (frontispiece, upper left), which is located to give complete control over traffic and major functions of the wing. The station juts out into the corridor to give clear vision up and down the hall. Across from the station is the day room for patients, which can be seen in the right background of the picture.

At upper right is a view of the reception area and information desk at the new hospital. Informal furniture groupings, in partitioned areas, provide privacy for family visits. The area has its own rest rooms. Doors lead into the patient examination and admittance areas. The whole atmosphere is bright and cheerful.

A classroom for staff training is located on the second floor of the hospital's rear wing (see lower left). Here new workers receive instructions on care of patients, and refresher courses are held from time to time. A sloping floor toward the platform makes clear vision possible from all parts of the room.

A full-sized swimming pool within the building is available for patient use under supervision of lifeguards trained by the Red Cross. Availability of a pool recognizes the value of aquatic therapy to patients. (Architects: Magney, Tusler & Setter, Minneapolis.)

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Published concurrently with this issue:

PUBLIC HEALTH MONOGRAPH NO. 5 . . . Domestic rats, rat ectoparasites, and typhus control.

Harvey B. Morlan, Bernice C. Utterback, Jack E. Dent, Maxwell J. Wilcomb, Jr., Melvin E. Griffith, and Leslie L. Ellis.

38 pages, illustrated. A summary and information on availability appear on pages 1131–1132.

PUBLIC HEALTH MONOGRAPH NO. 6 . . . Plague in Colorado and Texas.

Dean H. Ecke, Clifford W. Johnson, Virgil I. Miles, Maxwell J. Wilcomb, Jr., J. V. Irons.

54 pages, illustrated. A summary and information on availability appear on pages 1133–1134.

PUBLIC HEALTH REPORTS

FEDERAL SECURITY AGENCY
OSCAR R. EWING, *Administrator*

PUBLIC HEALTH SERVICE
LEONARD A. SCHEELE, *Surgeon General*

Public Health and Clinical Laboratories *in the* Diagnosis of Enteric Bacterial Infections

By ELBERTON J. TIFFANY, M.D.

Remarkable progress has been made in the prevention and treatment of many infectious diseases, but very few, if any, have been completely eradicated. The classical acute bacterial infections of the intestinal tract still occur with sufficient frequency to be of concern to the physician in practice and in public health work, and the syndrome of acute infectious diarrhea of the newborn from time to time complicates the management of hospital nurseries. Although in the past 20 years reported cases of typhoid and paratyphoid fever in this country have decreased from 23,000 to approximately 4,100 per year (*1*), the annual incidence of reported bacillary dysentery in the past 10 years has increased from 19,000 to approximately 28,000. These figures do not include the instances of diarrhea of unspecified cause nor those cases of specific infection which are not on record because they were not reported.

This discussion is concerned largely with the role of the laboratory in the diagnosis of the *Salmonella* and *Shigella* infections of man. The salmonellae include the true typhoid and paratyphoid organisms of human origin which give rise to the classical enteric fevers, as well as more than 200 different identifiable serologic types which may be pathogenic for man in sporadic cases or outbreaks of acute enteritis but the reservoir of which is in the lower animals. The dysentery bacilli—the shigellae—are now recognized by the International Shigella Commission as constituting four major groups of a total of 30 types. (These are the organisms of acute bacillary dysentery and are practically always of human origin.) The alkalescens-dispar organisms are now accepted as constituting a special group, more closely related to *Escherichia* than to *Shigella* but still of interest in enteric bacterial infections.

Dr. Tiffany, officer in charge of laboratory consultation services of the Communicable Disease Center, Public Health Service, presented this paper at the twenty-first annual meeting of the Southern Branch of the American Public Health Association, Baltimore, Md., April 17, 1952.

Why Identification?

Our concern with the laboratory diagnosis of these infections arises from three considerations:

1. The nature and cause of an enteric infection cannot be determined with certainty without the assistance of appropriate laboratory tests. Typhoid or paratyphoid fever, the "food poisoning" type of *Salmonella* infection, and amebic and bacillary dysentery may frequently be suspected with a fair degree of accuracy on the basis of history, epidemiology, and clinical aspects, but the borderline or atypical cases are frequent enough to make accurate diagnosis impossible without laboratory confirmation.

2. Identification of the causative organism

should prove of assistance in the rational therapy of enteric infections in view of the reported favorable results with certain of the broad-spectrum antibiotics, particularly in the treatment of the systemic *Salmonella* infections (*2–5*) and of bacillary dysentery (*6, 7*).

3. It is important to know the source of the infection and to judge the likelihood that the case may in turn infect others. Is the organism of human origin, as for example the typhoid bacillus, perhaps derived from a permanent carrier, or does it belong to a group, such as *Salmonella typhimurium* or *Salmonella anatum*, commonly derived from an animal reservoir or a temporary human carrier? In the United States many *Salmonella* infections in the human are traceable to poultry and swine and to food products derived from them (*8*). *Shigella* infections, on the other hand, as well as true typhoid fever, are always of human origin. The epidemiology of a case must be understood if the spread is to be limited and recurrence prevented. This knowledge is incomplete unless the causative organism is known. The control problem is one thing if the infecting organism is proved to be the typhoid bacillus with its tendency to cause prolonged illness, to spread from person to person, and to give rise to the permanent carrier state. The problem is quite different if the organism is *S. typhimurium* or some other *Salmonella* of animal origin, with the likelihood of single accidental exposure and less probability of person-to-person transmission.

The laboratory procedures essential to the final identification of the salmonellae and shigellae have been well defined and are well known to the bacteriologists engaged in this work. Final critical identification of an organism may, however, be time-consuming and require materials and skills not available in the majority of laboratories. The time which is often necessary to accomplish complete identification and the consequent delayed report, sometimes couched in terms of antigenic factors and details with which the physician is unfamiliar, have caused some dissatisfaction and have led to the opinion that laboratory diagnosis of these organisms is largely academic. Fortunately, much information of value to the physician and public health worker may be on hand within a few days. Studies are now under way which for some of these organisms may shorten the diagnostic interval to hours. Within the last several years a number of workers (*9–11*) have defined the simplified procedures which make possible within a relatively short time the classification of the majority of organisms encountered as to the *Salmonella* or *Shigella* genus, the major group within the genus, and in many instances the complete specific identification of the pathogens most commonly seen, leaving only the infrequent problem cases for the reference laboratory.

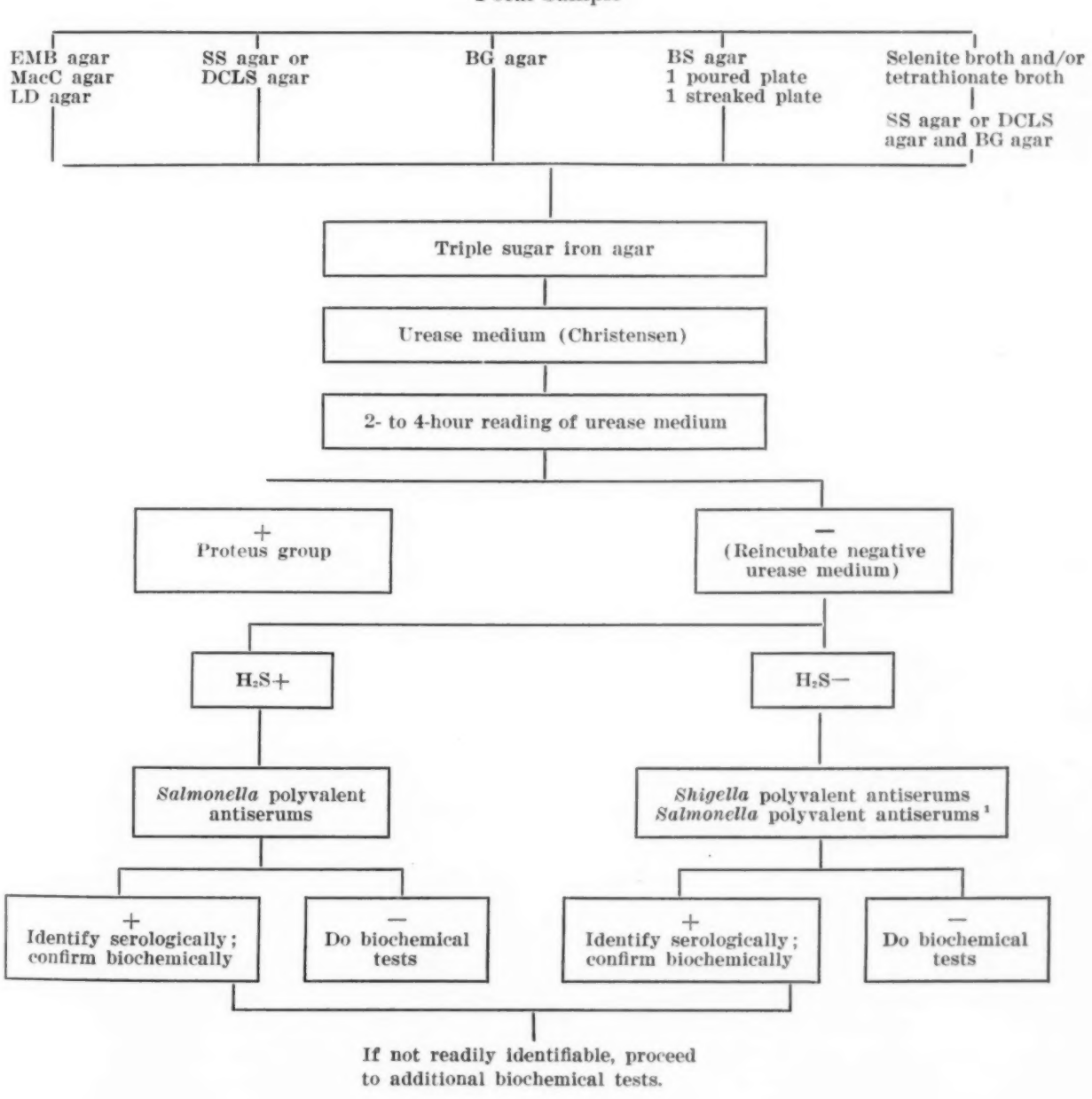
Degree of Identification Suggested

The degree of identification that may best be attempted by the various laboratories under consideration will depend mainly on need, facilities, experience, and type of laboratory. The several stages of procedure essential to complete identification of these enteric organisms are given in table 1, adapted from Edwards and Ewing (*11*). The salient features of procedure are further condensed in table 2.

The arrangement in table 2 suggests that the procedures themselves may logically fall into four stages of ascending complexity appropriate to different laboratories. It is not possible to be arbitrary about how much of the outlined procedure should be attempted by the various clinical and public health laboratories. The completeness of the service offered in any instance will depend on several factors such as demand, location and size of the laboratory, accessibility of possible reference laboratories, availability of reagents and, above all, upon the experience and interest of the laboratory staff. The interests of the two categories of laboratory are also somewhat different. The clinical laboratory will be expected to determine as early as possible whether the organism is a *Salmonella* or a *Shigella* in order that specific therapy may be more accurately focused. The public health laboratory will be concerned with more detailed information as to group and type of organism for the purpose of control and prevention of spread. However, both the practicing physician and the health officer will want, in the end, the same kind of information—full identification of the infecting organism.

The clinical or hospital laboratory which is equipped and staffed to do even a modest amount of cultural bacteriology could very well provide an effective screening service by carrying the procedure through the first four stages of enrichment, primary and secondary plating, isolation to TSI slants, and exclusion of the troublesome *Proteus* organisms by the routine use of urease medium. Organisms which on TSI slants give reactions consistent with salmonellae or shigellae and which produce no alkaline reaction on the urease medium are

Table 1. Outline of procedure for identification of Salmonella and Shigella cultures



[1] Occasional *Salmonella* cultures may fail to produce hydrogen sulfide in TSI agar. Also certain salmonellae and shigellae cross agglutinate. *Salmonella typhi* and *Salmonella gallinarum* are anaerogenic. Rarely, anaerogenic cultures of other types appear.

Table 2. Condensed summary of procedure for Salmonella and Shigella identification

1	1. The specimen: (a) Crude for immediate examination. (b) Preserved, buffered glycerol saline for transport. 2. Enrichment and primary plating media. 3. TSI slants (also give information on H_2S). 4. Urease media (allow detection and discard of *Proteus*).
2	5. Polyvalent *Salmonella* antiserum. Polyvalent *Shigella* antiserum. Preliminary biochemical tests (consistent with the genus): glucose, lactose, sucrose, mannitol, salicin, adonitol, citrate, MR, VP, indol, motility.
3	6. Group determination: *Salmonella* (6 group serums): A, B, C_1, C_2, D, E. Also Vi serum. *Shigella* (5 group serums): A, B, C, D (dysenteriae or Shiga, flexneri, boydii, sonnei, alkalescens-dispar,[1] respectively). 7. Simplified typing which will identify *S. typhi*, *Salmonella paratyphi A*, *Salmonella paratyphi B*, *Salmonella paratyphi C*, *S. choleraesuis*, and *S. typhimurium*. H factor serums a, b, c, d, i, and 1,2 and 1,5.
4	8. Complete critical typing, with complete biochemical study where necessary. Requires: (a) A complete set of O and H factor serums for salmonellae. (b) A complete set of group and type specific antiserums for the shigellae. (c) A staff experienced in the work.

[1] Alkalescens-dispar is included here although not now actually considered to belong to the *Shigella* group.

definitely open to suspicion as pathogens and merit further study. It is quite possible that this laboratory also might make its screening procedure more effective by performing the 11 simple biochemical tests indicated, which would further serve to exclude some organisms from consideration. Simple serology with commercially available antiserums might also be done. Unless the clinical laboratory in question happens to be one of the relatively few which are in a position to carry the examination further, the suspected isolate must at this point be referred to another laboratory—usually a public health laboratory.

The public health laboratory, whether at the city, county, or State level, as well as the large hospital laboratory, should be able to accept either the referred isolate described, or the primary specimen in transport solution, and carry it through procedures 6 and 7—group determination and even type recognition of the more commonly encountered forms. For the shigellae, this involves the biochemical and serologic procedures necessary to identify the organism as a dysentery bacillus and to place it in the dysenteriae, flexneri, boydii, sonnei, or alkalescens-dispar groups, and requires five serums. For the salmonellae, it is necessary to determine that the organism is indeed consistent with a member of the *Salmonella* group and to ascertain whether it is one of the species commonly of human origin, or whether it falls among the far greater number which are commonly derived from animals. Even these animal strains may often give rise to the temporary carrier state in man, whence they may for a time be the source of secondary cases.

Simplified Serologic Kits

This information in regard to the salmonellae can very largely be obtained by use of a simplified typing kit consisting of the six O factor serums A, B, C_1, C_2, D, and E; the five phase one H factors a, b, c, d, i, and the phase two H factors 1,2 and 1,5. The somatic Vi antiserum is, of course, also essential. Group A consists only of *Salmonella paratyphi A* and is rarely encountered in the United States. Most cases of *paratyphi A* infection seen here have usually originated in Mexico. In view of increased international travel today, however, it is perhaps well to include the serums necessary for the identification of this human pathogen.

Proper use of this simplified typing kit, plus the Kauffman-White schema, supplemented by appropriate use of a few biochemical tests, will allow the laboratory to identify *S. typhi*, *S. paratyphi A*, *Salmonella paratyphi B*, *Salmonella paratyphi C*, *Salmonella choleraesuis*, and *S. typhimurium*. In other words, proper use of such a kit will serve to identify, at least as to group, 98 percent of the *Salmonella* species pathogenic for man and likely to be encountered in the United States.

The biochemical tests and materials useful for the salmonellae are the same as those required for the shigellae. The four *Shigella* groupings serums and the alkalescens-dispar group serum suffice to give most of the information needed concerning a suspected dysentery bacillus.

For diagnostic work with the salmonellae and shigellae to be of value, the laboratory staff concerned must understand the properties of these organisms and their serologic relationships as set forth in the Kauffman-White schema and in the classification for shigellae proposed by the International Shigella Commission (*11*). Appropriate group and type specific factor serums must be available. Simplified serologic kits for the salmonellae and shigellae have been provided by the enteric bacteriology laboratory of the Communicable Disease Center to State health department laboratories desiring them. Appropriate serums for the simplified typing of the salmonellae and shigellae are now available commercially.

Certainly, every State public health laboratory should be able to provide the service so far outlined in identification of the salmonellae and shigellae. Private and public health city or county laboratories may also offer this degree of service. Excellent service in the laboratory diagnosis of enteric bacterial infections has been available for a long time in many hospital and city and county laboratories. The determining factors are demand, the availablity of the necessary diagnostic factor serums, and an experienced staff.

Work for the Reference Laboratory

In order to perform the final and complete critical typing of all *Salmonella* and *Shigella* strains which may be encountered, it is necessary to have on hand a much larger number of the O and H factor *Salmonella* serums as well as the necessary grouping and typing serums for the shigellae. When a new, unusual, or atypical organism is involved, final identification may be time-consuming and may require several weeks of attention from a staff thoroughly versed in all the vagaries of enteric bacteria. Studies requiring this degree of detail can only rarely be carried out routinely by the local laboratory and are the special province of the reference laboratory.

There are several well-known laboratories in this country which are equipped to undertake complete identification of the *Salmonella* organisms and which are associated with State or city health departments, a few hospitals, or the Public Health Service. Whatever their organizational position, these reference laboratories have certain features in common—they are staffed by individuals who have long experience with these organisms and who for the most part make their own serums.

The serologic relationships of the *Shigella* organisms have only recently been more clearly defined, and complete serologic analysis has not been as widely practiced on this genus. The good hospital or public health laboratory should be able, however, to isolate the organisms and identify them as to group. For complete typing, the shigellae may also be sent to the several appropriate reference laboratories in this country.

Anyone attempting to work in the laboratory with these enteric organisms will soon encounter the paracolon bacteria and will find them troublesome. The paracolon bacteria comprise a considerable spectrum of organisms falling into numerous subgroups with relationships ramifying among the salmonellae, the shigellae, and the colon bacilli. Although generally nonpathogenic and of nuisance value only in laboratory diagnosis, some strains may cause serious illness in man. They cannot therefore, always be disregarded. Much work remains to be done with the paracolon bacteria; there is at present no royal road to their recognition and exclusion. They are, in general, slow lactose fermenters and may give a delayed urease test only faintly positive after 48 hours of incubation. It seems inevitable that any system of screening enteric pathogens, as suggested here, will catch many paracolons in the net. The true identity of these organisms will have to await study by the reference laboratory whose staff can cope with the vagaries of the group.

Type identification of typhoid bacilli by means of bacteriophage is an important tool in epidemiology. But phage typing of the typhoid bacillus and of *S. paratyphi B* is a highly specialized procedure requiring care in the preparation and maintenance of the parent strains of bacteria and phages, and special training on the part of the staff. In view of these considerations and the low incidence today of typhoid fever, it has been considered preferable that specimens for this work be referred to one of the

14 special bacteriophage typing centers established in the United States (*12*).

Pathogenic Types of Escherichia coli

In the diagnosis of enteric bacterial infections a new field of considerable interest has been opened within the past few years. There is now evidence that at least certain identifiable strains of colon bacilli may be capable of causing primary enteritis.

Kauffman (*13*) in 1944 and in 1947 (*14*) published the results of his studies on the *Escherichia coli* group to which he had applied those techniques of antigenic analysis which have proved so valuable with the salmonellae. He also suggested "as a working hypothesis" that a number of the *E. coli* groups serologically identifiable by these techniques would prove of importance in certain of the infectious diseases of man. Approximately 125 O groups of colon bacilli have now been defined. Members of two of these groups have been isolated from cases of infectious diarrhea of infants, and also, on occasion, from enteritis in the adult, under circumstances which indicate a causal relationship. These two types are 055-B5 and 0111-B4, and may be identified by simple slide and tube agglutinations using appropriate serums. It would appear that at least every major public health laboratory should have on hand these serums and should be familiar with their proper diagnostic use in cases of enteritis from which the more common pathogens seem to be absent. Other serologically distinct coli types may be shown to be related to human disease.

Rogers and associates (*15*) in England in 1949 suggested the value of chloramphenicol on the basis of their experience with a small series of cases of enteritis in children apparently caused by a serologic variety of *E. coli*. Smith and his associates (*16*) in 1950 reported encouraging results with chloramphenicol in the treatment of cases of infection with coli type 055. Only this year a hospital outbreak of infantile diarrhea has been reported by Modica, Ferguson, and Ducey (*17*) in which *E. coli* 0111-B4 was isolated from 45 cases. Chloramphenicol, aureomycin, and terramycin appeared effective in treatment. If this experience with chloramphenicol and other antibiotics is borne out, it is possible that the larger hospital laboratories may likewise find use for these diagnostic serums.

Recommendations

1. Every State public health laboratory and the larger local public health laboratories should be equipped to isolate *Salmonella* and *Shigella* organisms from the primary specimen, to identify them as belonging in all probability to the *Salmonella* or to the *Shigella* genus, and to carry them through group identification.

Laboratories of this caliber should also be able to identify specifically the typhoid bacillus, *S. paratyphi B* and *C*, as well as the more common salmonellae of animal origin, such as *S. typhimurium*, *S. choleraesuis*, and a few others which may by experience have been found common and important in a given locality.

2. The local hospital, clinic, or smaller public health laboratory may either refer its specimens directly to the nearest laboratory equipped to handle them throughout, or may process the specimens to the point of detecting suspicious organisms and of determining that these are at least not *Proteus* or *Pseudomonas*.

These smaller laboratories might even find it practicable to apply the simpler biochemical tests indicating that the organism in question is consistent with a *Salmonella* or *Shigella*. The suspicious organism should then be referred to the appropriate laboratory.

3. Complete critical typing is the function of the larger and specialized reference laboratory which may, depending upon circumstances, be functioning at the local, State, or national level.

One last comment, somewhat in the nature of a plea, appears appropriate. The bacteriologists who examine and study these specimens in the laboratory will be eternally grateful to the physicians who submit the specimens if they will send in at the same time a brief summary of the outstanding facts pertaining to the case: animal or human origin; case or suspected carrier; age and occupation; acute or insidious onset; duration of illness; probable exposure; possible food source. Many of the bacteriolo-

gists engaged in this work are deeply interested in the clinical and epidemiological data enumerated above. Without this information their own horizon is narrowed and their usefulness in the matter of communicable disease control is impaired.

NOTE: The Communicable Disease Center does not wish to duplicate services which are available locally. The CDC laboratory branch, therefore, accepts specimens for study only when submitted through a State health department laboratory (*18*).

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State and Territorial Health Officers' Conference

The 1952 Annual Conference of the Surgeon General of the Public Health Service and Chief of the Children's Bureau with State and Territorial health officers, mental health authorities, and representatives of State hospital survey and construction agencies will be held from December 8 through December 11. Open sessions will be held in the auditorium of the Federal Security Building, Washington, D. C., on December 9 and December 11, beginning at 9:30 a. m. The remainder of the conference will be devoted to executive sessions and committee meetings.

Meeting the Health Needs of the Child

By HAROLD C. STUART, M.D.

No one would have the temerity to advise how to meet all the health needs of children at all ages. I could not cover fully even the needs of the newborn; hence I will not attempt to cover any specific need or age period. I propose, rather, to present certain guiding principles which, it seems to me, must be followed reasonably well if the modern objectives of child health services are to be accomplished. I will also suggest how our present services should be altered to incorporate these principles.

Most of the principles are quite obvious; they follow logically from well-known features of child development and related health needs. Unfortunately, too little attention is given to these principles in planning health services for children and still less in their day-to-day application.

Guiding Principles

Although the needs of a growing child are constantly changing, there are certain characteristics or features of these needs which are common to all ages. I propose to describe a few of these features and then to state the guiding principle for child health services derived from each. Some of these principles are closely related but each deserves separate consideration.

Integration

Health needs for the most part are closely interrelated and interdependent. They cannot be dealt with independently of the setting in which they exist or individually without consideration of other needs.

Of course, children can be given diphtheria toxoid, for example, and thereby have one health need met without any consideration of the setting or of other health needs, but most of the things we try to do cannot be handled this way. It is unwise, for instance, to prescribe feedings for infants in specific detail without considering the infant's size, rate of growth, activity, relationship with his mother, emotional responses to his care, and other complex situations.

A common fault of the well-child conference is that it isolates a few health needs of the infant, concentrates upon them, and deals with them didactically while ignoring importantly related subjects. The opportunities for this approach are limited.

Insofar as possible, then, the health needs of an individual should be considered as a whole, by the same person or, preferably, by persons working closely together as a team. The latter method permits broader scope and the use of several approaches but still offers an integrated program.

Flexibility

Health problems and needs of all children are constantly changing. Though certain basic needs exist throughout infancy, childhood, and adolescence, even these change quantitatively, qualitatively, and in the manner in which they may be met. They tend to change very rapidly during periods of rapid growth and physiological development—most rapidly in early infancy, progressively more slowly during childhood, and again rapidly during the unstable period of adolescence.

Dr. Stuart is professor of maternal and child health, Harvard University School of Public Health. *He presented this paper at the forty-eighth Annual Health Conference, Lake Placid, N. Y., June 5, 1952.*

Therefore, health services must be flexible; they must be adaptable to the unusual as well as the characteristic needs of each group. The service must grow with the children it serves. This is particularly true of the family physician or pediatrician. The well-child conference often fails to serve the preschool child satisfactorily because it is geared to the needs of infants and is not readily adaptable to the more complex needs of the older age group.

Continuity

The total health needs of a child at one age are determined to a considerable extent by past experiences. They, in turn, influence future problems and needs. Of course, many problems are transitory, but others, particularly emotional needs—such as the infant's need for affection and security—have long-time significance.

A poor mother-child relationship may produce different kinds of behavior problems and have different effects upon feeding and nutrition at succeeding ages. Although under favorable circumstances these problems tend to resolve themselves, a disturbing relationship continuing for a long time is likely to have lasting effects upon the personality and the emotions of the child and be reflected in his dietary and other habits.

In view of these circumstances, continuity of services and a periodic follow-up are essential if the factors contributing to a child's health problems are to be appreciated. Periodic visits for health services permit a long-time view of a child's health and progress.

Individual Differences

Because of the great differences between children in all attributes, their health needs necessarily differ greatly. Although there are common characteristics of the health needs of all children at each stage of development, the needs of each child differ in their timing, their urgency, and the ways in which they may be met successfully. They differ also in their combinations and in the manifestations of their neglect. Individual differences derive mainly from constitutional factors, but also from environmental factors.

There is much evidence that children succeed as well as they do in accomplishing their objectives in growth and development because of their inherent capacity to adapt to and make up for difficulties. The evidence is clear, however, that the potential for growth progress and for adaptation varies widely among individuals, as do all other attributes.

Only by knowing a child's basic characteristics, his environment, and his responses to his environment can one give the best counsel as to meeting his needs. Hence, to be most effective, health services for the child must provide for continuing study of him as an individual and of his environment. A continuing and reasonably broad health history and repeated evaluations of the child's status and progress and of the adaptations which he is making are essential. Thus, continuity of services means more than a loose connection between episodic services at succeeding ages. It implies, rather, periodicity appropriate for age with continuity in procedures and records.

For example, repeated evidence as to a child's leanness or fatness and his consistency or change in body build throughout the years is essential for proper interpretation of his weight. In most of our schools, weights and heights are taken and recorded periodically, but in relatively few instances is this information utilized to provide an adequate understanding of each child from the standpoint of his build, his habits, and the problems with which he may be faced for life in attempting to maintain proper weight.

Rapport

Health services can be made effective only by influencing the mother during the child's early life and by influencing the child directly more and more as he grows older and acquires independence. During adolescence, it is the direct influence upon the boy or girl which is most effective. Health services, however, must often be mediated through the personnel of the school and at times through a variety of community contacts. When several people are involved in giving instruction and guidance, good teamwork is required to assure consistency.

Derived from this feature is the principle that the health needs of the child can be met effectively only by establishing rapport with

him and with those who care for him. Some needs, of course, can be met through general services operating in the community or through services dealing with children collectively. Health protection and promotion as we view them today require, in addition, individual services brought directly to each child and his family at home, at school, in the doctor's office, or at health centers. Those giving the services must understand their respective roles and regularly take counsel together.

Related to Medical Care

The needs of the child in health are closely related to his illness experiences. Meeting health needs adequately is, in fact, the cornerstone of preventive medicine. Although health services and diagnostic-therapeutic services differ to some extent in objectives and in methods—for example, diagnostic-therapeutic services are more episodic in character, more difficult to organize and to provide in a standard way, and often require more facilities and professional workers than health services—it is frequently difficult to draw a sharp line between them. Furthermore, the health service personnel who know the child and family and have their confidence can be of immeasurable assistance in difficult situations arising during illness.

Hence, health services and medical care for children should be as closely related as circumstances permit. They may be provided effectively by the same person or by different persons, but in the latter case it is imperative that communication between all concerned with a given child be provided and utilized. In practice, the most elementary point of such integration of services is commonly neglected; the person responsible for one service to a child often does not even know who provides the other.

Principles Into Practice

If our present facilities are to provide effective health services for the child, these broad principles must be put into practice. I should like to suggest improvements which the various facilities can make toward the accomplishment of this goal.

General Practitioner

Ideally, the general practitioner should take a prominent part in providing health services for children. The part he plays can vary all the way from providing comprehensive care in health and in illness to providing only diagnostic and therapeutic services.

In the former situation, there are the problems of stimulating the physician's interest in health services, of his obtaining the necessary knowledge and understanding of the scope of health services as currently conceived, and of educating him as to the community resources which he can utilize for the benefit of children. There is also the ever-present problem of his giving the time required to do this work well.

When the general practitioner provides only medical care in illness, a known and accepted relationship should exist between him and some cooperating individual or organization which provides the health services. Many difficulties have been encountered in attempting to establish this type of relationship, particularly in large urban areas. There should be continuing efforts to improve understanding between general practitioners and physicians and nurses in child health conferences or other health services, by personal contact.

Prenatal Clinic

It is obvious that the health needs of the fetus are related to the health and nutrition of the mother and that an important function of the physician is the prevention of congenital disease or damage from improper intra-uterine environment or from traumatizing labor or delivery. One of the present problems is to broaden the vision of obstetricians and others giving maternal care to encompass the social, psychological, and educational factors affecting the course and outcome of pregnancy. More consideration needs to be given to the part played by the husband in family planning and to his preparation for effective parenthood. Both parents should be given more training in infant care and more help in psychological and social adjustments in anticipation of the birth of the baby. To add these services to present prenatal care programs requires not only more time and interest on the part of the physician

and nurse but also greater participation by auxiliary personnel on the maternal health service team.

Child Health Conference

The same general considerations apply to the infant and preschool child health conference as to the prenatal clinic, but the child health conference is further advanced in the practice of the principles of child health services. The objectives of the physician and nurse providing well-child conference service today are very different from those of only a few years ago. The primary objective is to build up the mother's competence by giving her the knowledge and attitudes necessary for successful child care and rearing, and by helping her to understand her own child and his particular needs.

The mother should be encouraged to study her own child and to share her observations, problems, and plans with the physician and nurse. She should come for counsel and not merely for instruction. She should be encouraged to consider the long view, to plan for the future. Most of these opportunities are lost when service is terminated at 1 year. Mothers thus oriented early will usually demand continuing or periodic health visits during the preschool years.

Dr. Martha Eliot of the Children's Bureau has recently pointed out that the child health conference today is directed toward helping parents with normal, everyday problems in the growth and development of their children. She has raised the question, however, as to whether the child health conference needs revamping to serve as an effective tool for this purpose.

Preschool and School Health Services

The nursery school and the day-care center should be more intensively utilized for the study and training of the child. This will be most effective if done in cooperation not only with the mother and the home, but also with the physician or health conference personnel.

After the child enters school, teamwork becomes vastly more important yet more difficult because so many people have a part in his care and education. There must be close understanding between the home and the school, between the school health service and the family physician, and between the educational staff of the school and the health personnel.

In high school, a satisfactory relationship should be established between the school health service and the students, ideally between the school physician and each child. Present preoccupation with finding defects must give way to securing a better understanding of each child's characteristics and needs, and in conveying this understanding to him and his family. Motivating both the child and his family to constructive action is an important objective. For this purpose, health interviews are of greater importance than routine screening examinations.

Summary

I have implied many challenges to our child health services with the intent of stimulating all workers to be alert to opportunities for improving them. Much progress has been made in recent years, but we are still a long way from meeting all the health needs of every child at all stages of his development.

Primarily, health services for children need to be more integrated, both in relation to the needs of the moment and from age period to age period. Also, health counsel should be based on an understanding of the growth progress and the individual attributes of each child. We cannot expect to attain these goals within the foreseeable future, but we must keep alert to improve those aspects which, admittedly, are unnecessarily weak.

Progress in Water Pollution Control

By CARL E. SCHWOB, M.S., and LEONARD B. DWORSKY, B.S.

"Water pollution has become a matter of grave concern in many areas, and its damaging effects on the public health and natural resources are a matter of definite Federal concern as a menace to national welfare. Abatement must be undertaken in order to control it." So stated the Senate Committee on Public Works in its report (S. Rept. 462, 80th Cong.) on the bill which was later enacted as the Water Pollution Control Act of 1948.

Recognizing this Federal concern, but also the primary responsibilities of the States in controlling water pollution, this act authorized the Public Health Service to take the initiative in developing or adopting comprehensive programs for the solution of water pollution problems in cooperation with the States, interstate agencies, municipalities, and industries. The act stated that comprehensive programs were to be developed for surface and underground waters, giving due consideration to all water uses—public water supply, propagation of fish and aquatic life, recreation, and agricultural, industrial, and other legitimate uses. It provided for Federal grants to the States and interstate agencies to help them carry out industrial waste studies, and for loans to municipalities to assist in the construction of needed abatement works. The latter provision was included with the intent that "The extension of Federal credit to local agencies for construction of pollution abatement works will greatly stimulate the construction phase of the comprehensive program and thus encourage the early accomplishment of urgently needed abatement measures" (S. Rept. 462, 80th Cong.).

The act further provided for Federal research and technical and consultative assistance to State and interstate agencies, municipalities and industries, and for the encouragement of uniform State laws, interstate compacts, and cooperative State activities in the field of water pollution control. Initial responsibility for enforcement of pollution control measures was left with the States; Federal authority was to be exercised only on interstate waters, only after the efforts of the States had been exhausted, and only with the consent of the States.

To accomplish these tasks, a Division of Water Pollution Control was set up in the Bureau of State Services of the Public Health Service in Washington, and 10 field units were established, located according to drainage basin areas. Each of these field units is staffed with four to seven engineers and scientists who have had extensive experience in water pollution control work. The accompanying map shows the basin areas. The Environmental Health Center at Cincinnati serves as the research facility on water pollution problems.

Thus far $5.38 million has been made available for Public Health Service activities under the act. An additional $2.9 million has been provided for grants to State and interstate agencies for industrial waste research and investigations, and $4 million, the full amount authorized, has been provided for the new Environmental Health Center research facility at Cincinnati, construction of which is about 65 percent completed. No funds have been

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made available for the extension of Federal credit to assist local communities in the construction of treatment works.

In general, the multiple functions of the Division of Water Pollution Control fall into three broad categories: planning and development of comprehensive programs, execution of the programs, and technical services and research. Some of the activities, however, fall partly into one and partly into another of these groups.

Drainage Basin Reports

During 1949 and 1950, water pollution data available from State and Federal sources were assembled and analyzed. The information, covering 226 river basins in the United States, of which 146 are interstate, has been made available in 15 drainage basin reports, representing joint statements of the Public Health Service and the States involved. These reports provide, for the first time for most of the Nation, the names of the cities and industries that are creating pollution and are thus responsible for its abatement.

The data in these reports have been summarized and published in a national inventory of the water pollution problem, "Water Pollution in the United States." This summary indicates that in July 1950 there were more than 22,000 sources of pollution in the United States—11,800 municipal sewer systems and 10,400 independent factory waste outlets. It reports further that despite the reduction of pollution by 9,300 treatment plants in operation, including 6,700 municipal and 2,600 industrial plants, wastes still discharged into rivers and lakes are equivalent to those from a population of over 150,000,000. To handle this volume of polluting wastes, 6,600 more municipal sewage treatment plants or additions to present plants and 3,500 more industrial waste treatment plants or additions will be required. An estimated $9 billion to $12 billion in public and private investments will be necessary over the next decade to meet these needs and to keep up with industrial expansion and population growth.

Reporting and Education Program

Often in the past it has not been possible, even after publication of reports and surveys, to

press forward on developing methods and procedures for making use of the facts. The reporting and education program developed under the provisions of the Water Pollution Control Act has made good progress toward getting the facts before the people who are in a position to use them.

Through the official State water pollution control agencies, the drainage basin reports are being made available to local community leaders and organizations, since the people in each community must take the steps necessary for the solution of their own problems. Many national organizations, such as the General Federation of Women's Clubs, the Rotary Clubs, the Kiwanis Clubs, and the Izaak Walton League of America, are also helping to get this information to the local communities.

In connection with the assembling of data, assistance has been given to State and interstate agencies in the conduct of studies, surveys, and investigations. Surveys of more than 88 streams and coastal water areas and investigations of almost 150 technical pollution problems have been made. By thus pooling State and Federal resources it has been possible to carry out many studies which, alone, neither the Public Health Service field staff, State nor interstate personnel would have been able to undertake.

Uniform State Policies

After analyzing existing State water pollution control laws and after consultation with State and municipal groups, conservationists, industrialists, and other individuals interested in water pollution control, the Public Health Service developed a Suggested State Water Pollution Control Act. The Council of State Governments endorsed and recommended it to the States for favorable consideration. Even before this model law was fully developed, the Service made its staff available to States requesting information on proposed legislation, and it is continuing this practice.

Although most State legislatures have met only once since the development of the suggested act, its principles have already been utilized in enacting new water pollution control legislation or major amendments to existing legislation by Arkansas, Illinois, Kentucky, North Carolina, Ohio, South Carolina, and Vermont. Specific principles of the act have been reflected in legislation which strengthened the water pollution laws of Maine, Minnesota, New Hampshire, and Tennessee, and legislation based in large measure on the suggested act has been prepared for or introduced in the legislatures of many other States (Arizona, Colorado, Idaho, Missouri, Montana, Nevada, and Utah are examples). Thus progress toward achieving uniformity in the policies of the various States is being made.

The Public Health Service works closely with other Federal agencies on water resource problems by providing basic data on water quality, water use, and water pollution control measures, and by participating in the activities of the Federal Inter-Agency River Basin Committee and several similar field committees in various areas of the country.

Interstate Problems

During the first 3 years of operation, no formal enforcement action was attempted. Nevertheless, the Public Health Service has worked directly with a number of State agencies toward solution of interstate pollution problems. The Water Pollution Control Act has been important in making it possible for the Service, acting as a third party, to assist in solving interstate problems without resorting to the act's formal enforcement proceedings.

Assistance has been given in the formation of regional pollution control councils in areas not covered by formal interstate compact groups. Such councils now exist in six drainage basin areas. Acting in an advisory capacity, they provide a means for facilitating cooperative action by the States in a manner similar to that provided by the 10 interstate agencies which have formal compact arrangements. The Pacific Northwest Pollution Control Council, for example, has brought about the adoption in its area of uniform water quality objectives and treatment works design standards.

Grants to States

To help in the execution of the State water pollution control programs, the Congress made

available grants to the States for studies, surveys, and research on water pollution caused by industrial wastes. As a result State activities have been substantially increased in both dollars and manpower (see table). In 1950 the States spent slightly more than $2 of their own funds for each dollar provided by Federal grants. By 1952 they were proposing to spend almost $4.50 of their own funds for each dollar of the Federal grants. By 1952 the number of professional personnel employed by the States for water pollution control activities had increased 71 percent over the total for 1949.

State funds expended and personnel employed by State water pollution control agencies, 1949–52

Year	State expenditure (excluding Federal grants)	Total professional and scientific personnel	Professional and scientific personnel employed for industrial waste studies
Total	$9, 243, 550		
1949	[1]	307	[1]
1950	2, 242, 478	418	173
1951	2, 984, 492	440	234
1952 [2]	4, 016, 580	525	285

[1] No data available. [2] Estimated.

Approximately 70 percent of the grant funds have been expended in studies and investigations of existing industrial pollution problems. In the first 2 years of the grant program, more than 260 major stream surveys were made by the States. These involved comprehensive sampling, laboratory analyses, location of pollution sources, and determination of effects on the stream. In addition, well over 3,000 individual pollution problems caused by the wastes of specific industrial plants were investigated.

The basic facts obtained through these field investigations permitted many States to accelerate determinations of pollution control measures required for industrial waste pollution sources, and they will be useful in stimulating needed construction.

Expanding field activity made it necessary for many States to enlarge laboratory facilities. Approximately 15 percent of the grant moneys were utilized for this purpose. Nineteen States have established new or expanded existing laboratory facilities, seven of them utilizing field laboratory trailers. Twenty-five other States have supplemented their laboratory equipment. The bacteriologists, chemists, and biologists added to staff the laboratories enabled some States for the first time to support adequately the activities of their sanitary engineering personnel.

Most of the State water pollution control agencies have felt that their greatest need was additional information in regard to the location and strength of industrial waste pollutants and the effects of these discharges in the receiving waters. Eighteen States have utilized grant funds for actual research on industrial wastes, and a considerable number of other States are supporting research programs with State appropriations. These studies include the phosphate mining and citrus wastes of Florida; the potato starch wastes of Idaho; the synthetic resin, paper de-inking, dye and textile wastes of Massachusetts; the vegetable and fish cannery wastes in Washington; and the metal-plating industry wastes in Ohio. Approximately 15 percent of the total grant funds have been utilized for research purposes.

Technical Services

The phrase "provide technical service" no longer means, as it once did, the assignment of a single, well-qualified individual to study a problem and produce an answer. In water pollution, as in so many of the problems in the world today, one science merges with another—chemistry with biology, biology with physics, and so on. In searching for ways to overcome pollution, there is need for a coordinated approach. The assistance which the Federal Government today extends to States, industries, and others under the heading "technical service," is really the combined services of sanitary and chemical engineers, biologists, and bacteriologists—men representing many branches of scientific knowledge.

For example, assistance has been requested in reviewing proposed programs and activities of

the States, in guiding the development of uniform water quality standards, and in determining beneficial water uses for subbasin areas.

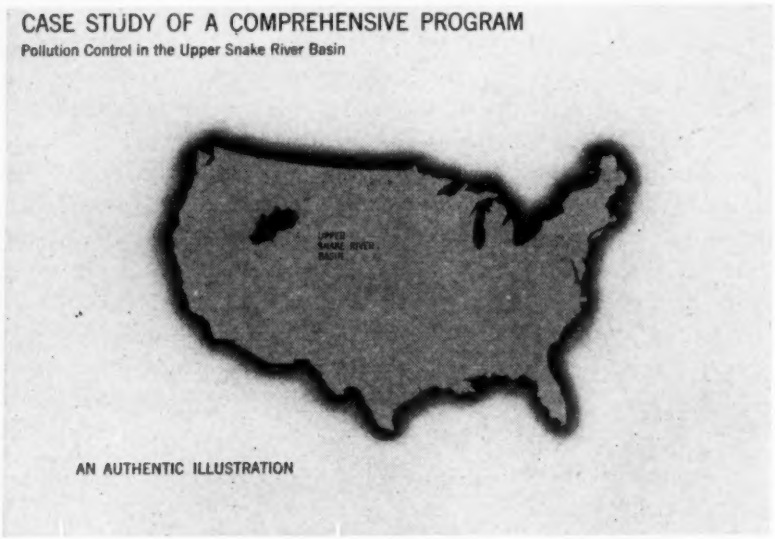
Requests are continually received for field technical people to participate in conferences, technical meetings, and similar discussions on a wide variety of pollution problems: (*a*) methods of controlling nuisance growths of algae and other aquatic vegetation which interfere with recreational uses of water; (*b*) effects of sewage-polluted irrigation water on public health; (*c*) causes of fish mortality; (*d*) toxicity of insecticides on aquatic life; (*e*) effects of industrial wastes on public water supply and on fish life; and (*f*) possible utilization of certain industrial wastes.

An illustration of the kind of technical service provided relates to the pulp and paper industry. The Public Health Service has worked with industry officials and with the States in determining sites for new pulp mills in the Pacific Northwest and in Alaska in order to safeguard the valuable salmon and other migratory fish which are found in these areas.

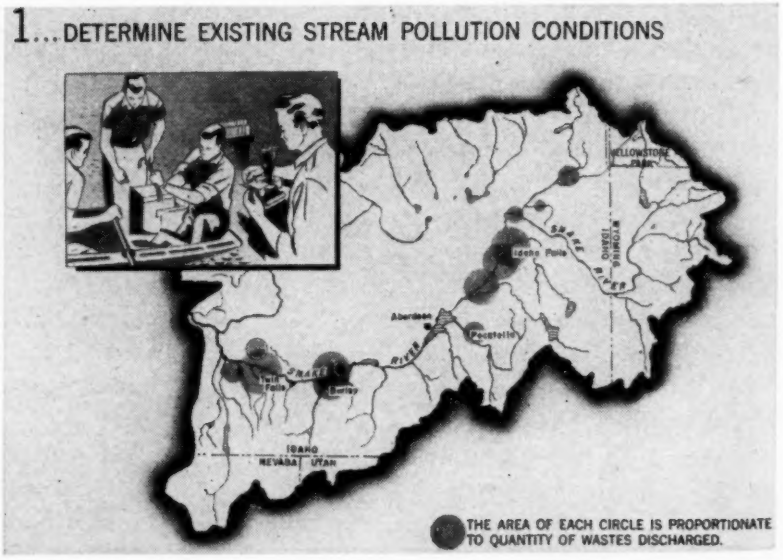
National Technical Task Committee

In keeping with the stress placed by the Congress on helping solve industrial waste problems, particularly those concerning industrial wastes for which there are now no known effective treatments, the National Technical Task

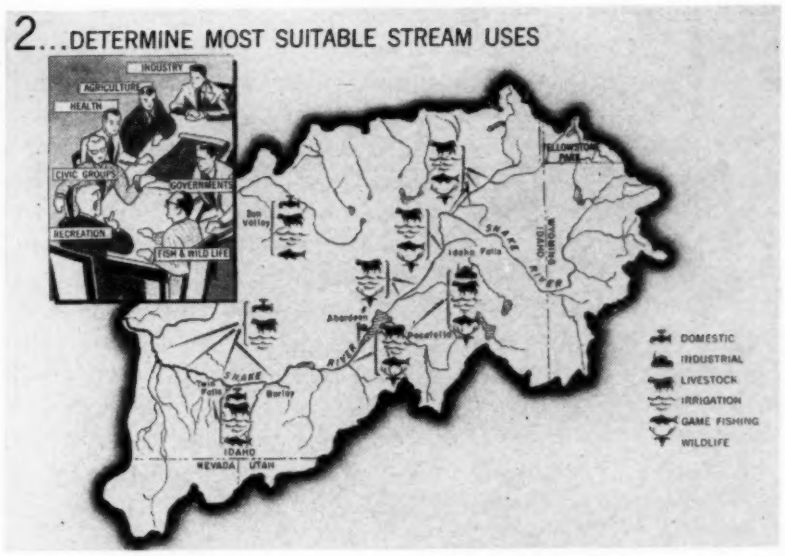
(*Continued on page 1086*)



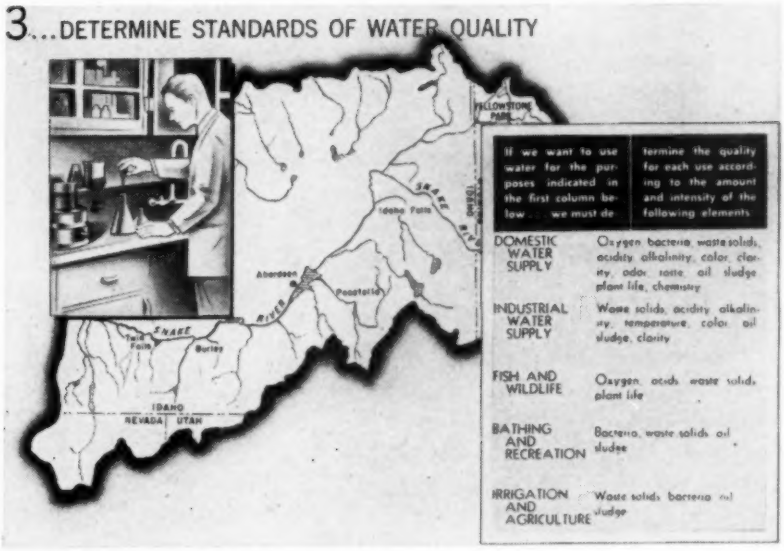
The following illustrations describe the steps in the development of a comprehensive program of water pollution control. The Upper Snake River Basin, which crosses four State lines, is used as an example. (Illustrations reproduced from "Environment and Health," Public Health Service Publication No. 84, 1951.)



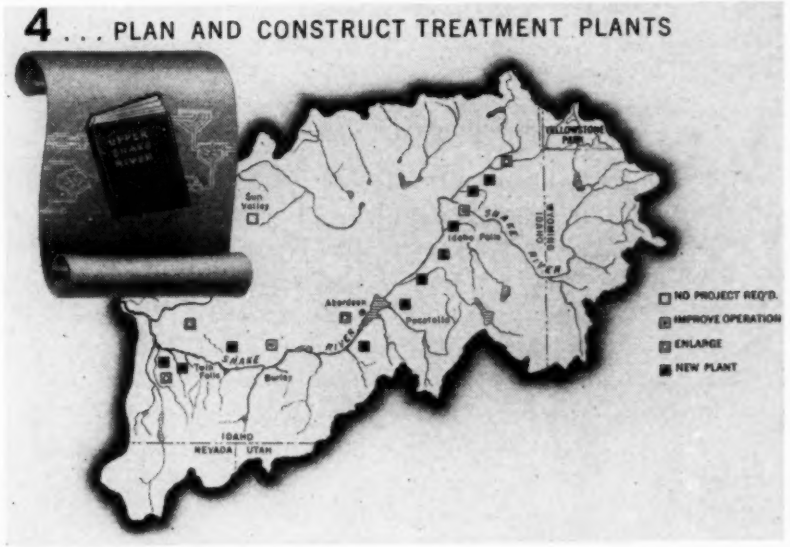
Technicians must seek out sources of pollution and determine the amount and kind of pollution in each case. If necessary, laboratory data are developed to clarify understanding of the sources, character, and effect of pollution.



The best use of the waters of streams must be determined before waste treatment plants are built because treatment of wastes will vary according to the quality of the water desired. Water pollution control authorities help by gathering, reviewing, revising, and interpreting data.



In any program of water pollution control, water quality standards for the legitimate uses of our waterways must be established. Oxygen, bacteria, waste solids, acidity, alkalinity, color, clarity, and taste are among the elements to be considered.



Once the sources and amount of pollution are determined and decisions made as to the most suitable water uses, steps are taken to determine the degree of treatment required at each source of pollution. The construction of treatment plants can be expedited by industry, municipalities, and State, interstate, or Federal authority.

Committee on Industrial Wastes was formed on invitation of the Surgeon General of the Public Health Service in May 1950. To meet its broad objective of "effecting an improvement in the quality of water resources in the Nation," the Committee undertook "to perform technical tasks pertaining to industrial wastes in cooperation with the Public Health Service and all others concerned with improving the quality of our water resources."

The functions of the committee are, briefly, to inventory, appraise, coordinate, and promote research and development work, and to stimulate further adoption of known practical methods of pollution control and treatment. The committee also seeks to bring about more effective working relationships between industry and the various levels of government.

The group has 57 members, designated by their respective industries. They represent 36 major industrial categories, covering 10,000 individual plants. The categories include: automotive, beet sugar, canning, chemical manufacturing, mining, meat and poultry packing, dairy products, distilling, electric, electroplating, fermentation, iron and steel, nonferrous metals, petroleum, pulp, paper and paperboard, rubber, tanning, and textile industries.

Tremendous value can be derived from the coordinated research and pooling of information which is available from a group having this wide representation. Further, the committee has been of great value in directing efforts of the Public Health Service to most needed areas.

Environmental Health Center Research

The research activities of the Environmental Health Center are complex and scientific. They extend over a wide range of investigations in the fields of chemistry, physics, engineering, and biology.

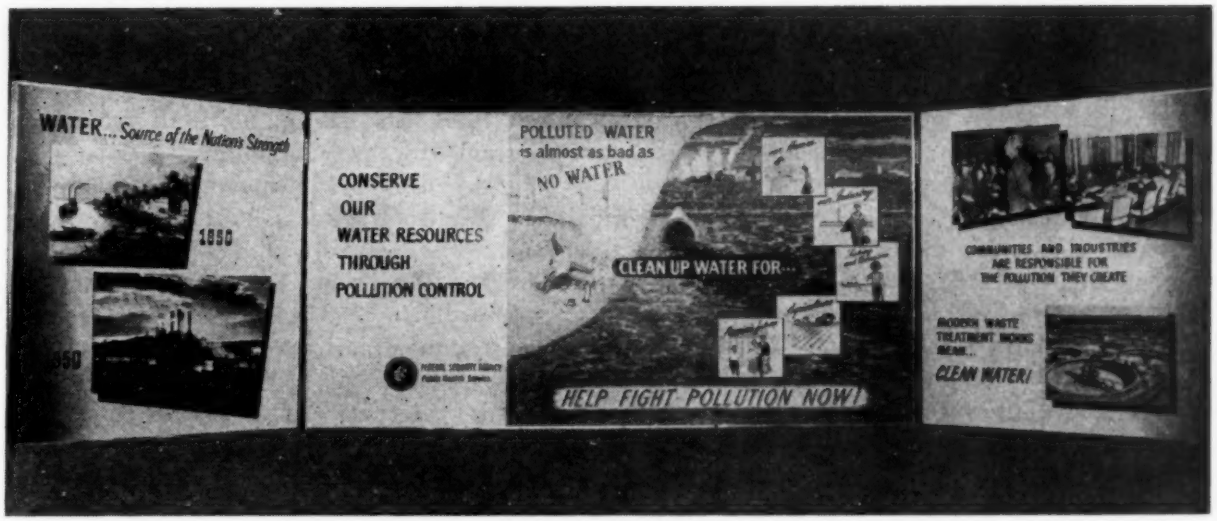
Some of the areas in which work is currently in progress include the development and evaluation of analytical techniques for both organic and inorganic materials; studies of persistence of particular organic compounds in water; application of biological oxidation processes to waste purification; studies of industrial waste sources, characteristics, and corrective measures; inventory surveys on pollution of water resources; development of biological methods for determining the severity and extent of pollution; studies of toxicity of water pollutants to aquatic life; development of bio-assay methods and their application to pollution control; development of methods for control of organisms responsible for tastes and odors in water supplies; studies of the pollution and purification of shellfish in aquatic environments.

Recent field investigations of synthetic rubber, steel, and kraft paper mill wastes are cited as examples of specific studies made in the industrial wastes field. Another current study involves the determination of radioactivity in surface and ground water and in fresh water life. Still another relates to the determination of cyanide in water and wastes.

A recent product of Environmental Health Center research is a greatly simplified technique for measuring chemicals in water. This new procedure is a significant contribution to the fields of public health and water supply operation. The rapid expansion of this country's chemical industry during the past 10 years has brought increasing burdens of chemical wastes to our streams. Frequently, those wastes cause serious taste and odor problems in the public water supplies drawn from the streams. Possible hazards to public health because of these foreign chemicals are yet unknown. The advantages of the new technique over the old test-tube processes of chemical analysis, with respect to both cost and speed, will permit more rapid progress in determining the extent of the problem and the earlier development of means for handling it.

Future Outlook

The progress hoped for at the time the water pollution control program was developed has not been completely achieved. During World War II, construction of sewage treatment plants declined rapidly. After the war, construction resumed and the rate advanced fairly rapidly until by 1950 a rate well above the average for the previous 35 years had been attained. In 1950 the dollar volume of municipal treatment plant construction was about $200 million. Then, shortages due to the defense build-up



Now available on loan is this three-panel exhibit recently developed by the Division of Water Pollution Control. It highlights the importance of pollution abatement in conserving our water resources and stresses the responsibility of communities and industries for cleaning up the pollution they create. Featured on the center panel is the five-color poster, "Help Fight Pollution Now!" The exhibit has been shown at several national conventions. Each drainage basin office has a similar exhibit for use within its area.

The exhibit is designed for ease in handling. With the two end wings folded across the center panel (6′ x 3′) and the legs and lights (not shown) detached, the complete exhibit can be packed in one case weighing approximately 225 pounds. For information concerning availability and conditions under which this exhibit may be borrowed, write to: Division of Water Pollution Control, Public Health Service, Washington 25, D. C.

placed obstacles in the way of sewage works construction, and in 1951 the volume dropped to about $175 million. Tentative figures covering the first two quarters of 1952 indicate that this year's rate may be slightly lower than that for 1951. An annual rate of construction almost three times that attained in 1951 will be required over the next decade in order to eliminate the backlog of municipal treatment plant needs and meet current needs as they arise.

Although data are not now available on progress in the abatement of industrial pollution, general indications point to the necessity of substantial acceleration.

Adding urgency to the need for elimination of industrial wastes from the streams, particularly those new types resulting from relatively recent developments in chemical and allied industries, is the realization that not only do those wastes destroy or reduce the usefulness of the streams they enter, they also pose problems in the treatment of public water supplies. Existing water purification methods have been notably successful in removing from drinking water supplies the contamination caused by organic wastes. However, knowledge is limited as to the effectiveness of known methods of treatment for the many new types of pollutants—chemicals, phenols, synthetics, pharmaceuticals, and radioactive materials. There have already been numerous instances of taste and odor problems arising in public water supplies exposed to even minute quantities of such wastes. Basic information as to the physiological effects of such contamination is also lacking. Treatment of those wastes at the source, before they enter the streams, would remove this hazard to health and a complex water treatment problem.

If this country is to maintain its existence as a highly industrialized and urbanized nation, waste treatment works must be considered not as single-shot operations but as permanent facilities which must be maintained and preserved. Otherwise, water, the lifeblood of the Nation, will suffer, and all the difficulties that face a nation that has destroyed its water resources will follow.

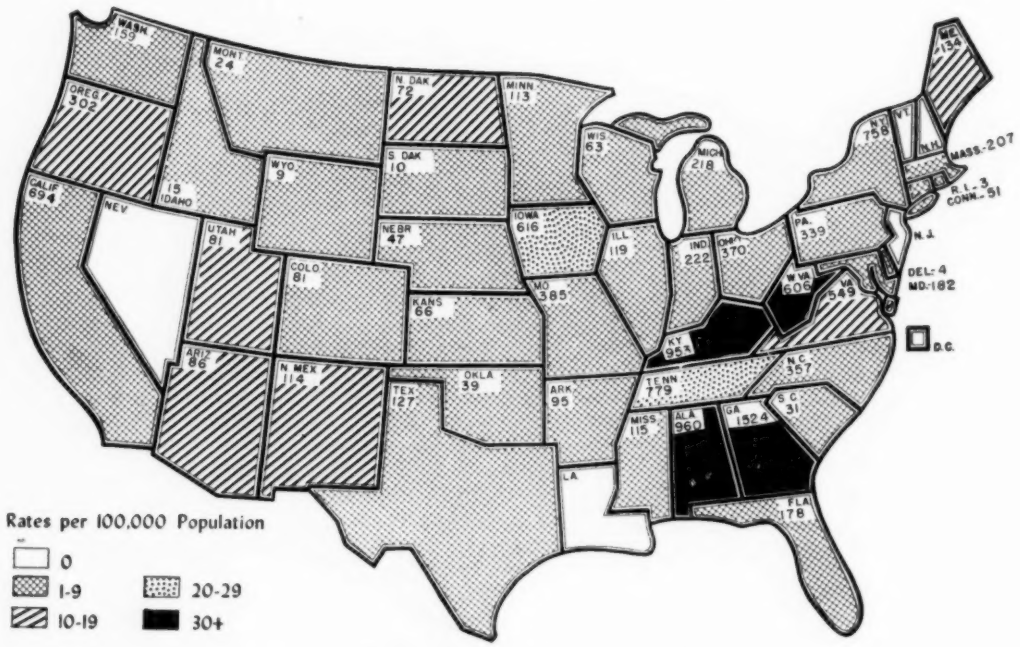
The National Association of Manufacturers' report, "Water in Industry," has clearly stated the viewpoint of industry: "A shortage of water for industrial purposes—just as surely as a shortage of manpower, of materials, or of capital—could defeat our hopes for future growth and prosperity and even imperil our national safety. No industry or business can long survive where water is unavailable or inadequate as to quantity and quality."

The report of the President's Water Resources Policy Commission, referring to the importance of pollution control to recreational uses of water, said: "No other phase of a water resources program promises so much toward expanding outdoor recreation opportunities as the cleaning up of our rivers."

On the need for pollution abatement to protect our fish and wildlife resources, the commission commented: "Plainly, a pollution abatement program is essential to the future of our wildlife resources. The abundance of wild animals and fish that might result from such a program stirs the imagination."

It is evident that much remains to be done before the problem of water pollution can be considered reasonably under control. The Public Health Service feels that with the cooperative efforts of the States, the interstate agencies, municipalities, industries, and the Federal Government success must and will be achieved, and that with respect to water resources, at least, this generation will be able to meet the requirements set up by Theodore Roosevelt, when he said: "The Nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased and not impaired in value."

Incidence of Infectious Hepatitis by State



Regular weekly reporting by States of the number of cases of infectious hepatitis began in 1952.

The provisional total for the first 39 weeks of 1952 is 11,868 cases. All States reported except New Hampshire, New Jersey, Nevada, Vermont, and the District of Columbia. Georgia reported the largest number—1,524 cases. See map for distribution of cases and rates (per 100,000 population) by State for the first 39 weeks of 1952.

Although comparable statistical data are not available for previous years, the distribution of the disease has not been different from that described in textbooks.

The incidence of the disease in 1952 was highest in the winter and spring months. Epidemics have been reported most frequently from States with large rural populations. Many cases were found in school populations. In most instances, epidemiological evidence has pointed to a person-to-person spread of infection, although two outbreaks were reported where water was regarded as the vehicle of infection.

1951 Summary

Food and Water Borne Disease Outbreaks

Incidence of Infectious Hepatitis by State

The importance of reporting outbreaks of food- and water-borne disease has been recognized for many years. As long ago as 1912, the State and Territorial health officers recommended that the occurrence of outbreaks of certain diseases, including dysentery and typhoid fever, be reported to the Public Health Service. By 1923, the systematic collection and publication of reports of outbreaks of milk-borne disease was under way. In 1938, reports became more comprehensive and included outbreaks of illness in which water and foods as well as milk were vehicles of infection.

Prior to 1951, reports of outbreaks were collected at the end of the year, and a report was issued in annual summary form. Beginning in 1951, reports were sought on a current basis—as soon as possible after an investigation of an outbreak was completed. Since summaries of individual outbreaks have been included in weekly reports issued by the National Office of Vital Statistics, this material need not be repeated. Instead, it is summarized here in a narrative review, with three summary tables.

Reduction in Outbreaks

Fewer disease outbreaks in which food or water was the transmitting agent were reported in 1951 than in 1950, but the number of persons affected was approximately the same. The reduction (table 1) was due almost entirely to a decrease in the number of outbreaks in which foods other than milk and milk products were the vehicles of infection.

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The number of outbreaks of water- and milk-borne disease was reduced markedly—approximately one-half and two-thirds, respectively—between 1939–41 and 1949–51, the most recent 3-year period for which figures are available. Epidemics of milk-borne typhoid fever have declined (table 2) from an average of 12 per year in 1938–40 to about one epidemic annually in the period 1949–51; outbreaks of milk-borne streptococcal infection decreased similarly. The increase in the number of local areas that require pasteurization of milk and milk products and treatment and safeguarding of water supplies undoubtedly has been instrumental in reducing disease transmission by these vehicles. On the other hand, the actual number of reported epidemics in which foods other than milk or milk products were the vehicles of infection has increased in the last decade. This probably reflects more complete reporting rather than any real increase in frequency of such outbreaks.

Faulty methods of handling food and poor hygiene on the part of food handlers were frequent findings in investigations of outbreaks of food-borne disease in which foods other than milk were the vehicles of infection, according to 1951 reports of such outbreaks. In one-third of these epidemics refrigeration was found to be either inadequate or absent, especially in outbreaks in which cream-filled pastries, meats, and salads were the vehicles of infection. Storing meats in a warming oven or steam table for several hours before serving was another practice conducive to bacterial growth. Food handlers with "sores" or dermatitis on their hands, and others having sore throat, colds, or even diarrhea, were sometimes permitted to prepare or handle easily contaminated foods.

These findings indicate very clearly that many persons operating or employed in food establishments do not appreciate the importance of proper handling of foods and of good personal hygiene in preventing food-poison and food-infection outbreaks.

Data Analysis Difficult

Satisfactory statistical treatment or analysis of the data from reports of outbreaks of food poisoning or food infection is usually not possible. The very nature of the outbreak sometimes precludes an actual count of the persons affected, and only an estimate of their number can be reported. The interval between onset of illness and reporting of cases, as well as variation in types of investigation, is sometimes responsible for differences in completeness of reports. Samples of food served to persons ill in an outbreak of food poisoning may not have been available for laboratory testing; therefore, it would be "postulated" that the vehicle of infection was a given food which had been eaten by all, or nearly all, persons made ill and not eaten by those not ill.

Data obtained from reports of outbreaks of certain diseases represent only a fraction of the total cases of those diseases noted in routine weekly reports from the various States, while nearly equal numbers of other diseases are reported in both weekly and outbreak reports. Apparently, efficiency of reporting mechanisms rather than an actually greater occurrence of epidemics is reflected by the larger number of outbreaks of food- and water-borne diseases reported by some States. Perhaps the medical profession in these States is more conscious of its responsibility for prompt reporting of these diseases, personnel are available for investigations, and local or city health officers work in unison with the State health officer.

Lack of appreciation of the importance of prompt reporting and investigation of all food-poison and food-infection and other common-source outbreaks, or lack of personnel and facilities for investigation would seem to be indicated by the fact that 18 States made no reports of such outbreaks in 1951. In States with small populations, perhaps no outbreaks were brought to the attention of the State health officer, but this is not a reasonable assumption for States with large populations.

Vehicle of Infection

Milk and Milk Products

In four reported outbreaks of disease, milk apparently was the vehicle of infection. Only

Table 1. Summary of food- and water-borne disease outbreaks reported in the United States, 1938–51

Year	Water		Milk and milk products		Other foods		Undetermined		Total	
	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases
1938	48	31, 693	42	1, 685	70	2, 247	8	882	168	36, 507
1939	43	2, 254	41	2, 509	146	3, 770	17	1, 203	247	9, 736
1940	43	44, 184	43	1, 678	218	5, 588	18	1, 088	322	52, 538
1941	60	12, 039	37	1, 049	223	6, 070	20	1, 876	340	21, 034
1942	53	13, 271	45	2, 193	245	11, 420	37	1, 878	380	28, 762
1943	26	5, 712	40	1, 590	285	13, 938	38	2, 525	389	23, 765
1944	32	2, 686	41	1, 449	298	14, 558	22	1, 683	393	20, 376
1945	26	5, 859	29	2, 161	276	11, 547	12	637	343	20, 204
1946	32	4, 512	19	795	299	12, 526	6	312	356	18, 145
1947	24	6, 125	22	253	316	12, 536	27	1, 392	389	20, 306
1948	21	619	17	613	327	9, 962	10	466	375	11, 660
1949	25	1, 570	15	246	367	9, 043	10	616	417	11, 475
1950	15	1, 299	10	62	347	10, 174	7	564	379	12, 099
1951	7	3, 960	12	90	256	7, 182	2	12	277	11, 344

Table 2. Summary of disease outbreaks conveyed by milk and milk products reported in the United States, 1938–51

Year	Typhoid		Salmonellosis		Scarlet fever and septic sore throat		Food infection and food poisoning		Other		Total, all diseases	
	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases
1938	18	187	0	0	12	674	9	627	3	197	42	1, 685
1939	6	51	2	24	9	1, 324	19	749	5	361	41	2, 509
1940	14	120	0	0	5	482	17	855	7	221	43	1, 678
1941	12	120	0	0	3	219	15	483	7	227	37	1, 049
1942	5	42	1	4	7	620	23	1, 341	9	186	45	2, 193
1943	6	37	0	0	3	200	25	1, 278	6	75	40	1, 590
1944	8	359	1	6	2	171	23	816	7	97	41	1, 449
1945	3	72	0	0	3	308	18	1, 673	5	108	29	2, 161
1946	1	7	0	0	0	0	11	696	7	92	19	795
1947	3	57	1	28	0	0	16	162	2	6	22	253
1948	1	11	0	0	1	67	11	350	4	185	17	613
1949	1	7	0	0	0	0	10	218	4	21	15	246
1950	0	0	0	0	0	0	7	54	3	8	10	62
1951	1	2	4	42	1	20	4	14	2	12	12	90

36 persons were affected in these outbreaks, each caused by a different organism, *Salmonella typhosa*, *Salmonella paratyphi B*, *Streptococcus viridans*, and a staphylococcus. Raw milk was involved in three of the four outbreaks; in the fourth, pasteurized milk was used, but it was found that there had been opportunity for contamination after pasteurization. One outbreak involved 10 families, totaling 40 individuals, who were supplied from a herd of cows in which one animal was found to have an "infection" of the udder. Both hemolytic staphylococci and hemolytic streptococci were found in samples of milk from this herd. The other outbreaks are described below.

An ill-defined group of illnesses was observed in 10 children who had been drinking canned milk. The illnesses ceased when another milk product was substituted.

Ice cream was the vehicle of infection in 3 outbreaks of food poisoning in which 42 persons became ill. The infective agents in these outbreaks were, respectively, *Salmonella oranienburg*, *Salmonella typhimurium*, presumably from duck eggs, and a staphylococcus.

Raw buttermilk, from which a staphylococcus was isolated, was believed to be the source of infection in a small outbreak of illness in one family. Fruit cottage cheese, from which *Escherichia coli* was isolated, was regarded as the vehicle of infection in another small outbreak, and in two others processed cheese caused symptoms of food poisoning.

Other Foods

Contaminated foods other than milk, milk products, and shellfish were the cause of nine-tenths of the common-source outbreaks of food poisoning reported in 1951 (table 3). In 53 outbreaks poultry meat and eggs were found or suspected to be the vehicle of infection. Of these, 8 proved to be caused by *Salmonella*, which suggests that the fowl or eggs were naturally infected. Processed hams, frequently precooked, were the source of infection in 38 outbreaks, nearly all of them due to a staphylococcus. Beef, usually roasted, was found to be the probable source of infection in 32 outbreaks, and miscellaneous meats in 25. Custard-filled pastries were another common vehicle of infection. There was bacteriological or epidemiological evidence that eclairs, cream puffs, cream pies, and similar types of pastry were the vehicles of infection in 34 outbreaks. Salads, fish, sandwich fillings or spreads, and creamed vegetables were suspected of being the source of infection in 34 outbreaks. In some outbreaks the exact vehicle of infection could not be de-

Table 3. Summary of food-borne outbreaks other than milk and milk products reported in the United States, 1938–51

Year	Botulism		Chemical food poisoning		Dysentery		Food infection and food poisoning		Typhoid and salmonellosis		Miscellaneous and unknown		Total, all diseases	
	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases
1938	5	11	0	0	3	118	42	1, 832	17	272	3	14	70	2, 247
1939	9	16	0	0	2	99	122	3, 167	7	346	6	142	146	3, 770
1940	5	17	2	9	4	318	176	4, 983	14	136	17	125	218	5, 588
1941	6	20	5	78	6	443	182	5, 176	14	159	10	194	223	6, 070
1942	7	20	8	509	2	90	210	10, 566	8	180	10	55	245	11, 420
1943	4	10	3	54	7	1, 029	255	12, 436	10	227	6	182	285	13, 938
1944	9	29	8	105	7	939	252	12, 065	11	67	11	1, 353	298	14, 555
1945	12	36	6	34	3	292	233	10, 218	12	163	10	804	276	11, 547
1946	7	15	10	1, 484	1	40	265	9, 838	6	56	10	1, 093	299	12, 526
1947	12	31	6	1, 047	3	72	279	11, 023	10	215	6	148	316	12, 536
1948	7	30	5	74	1	120	289	8, 832	4	30	21	876	327	9, 962
1949	4	34	5	31	4	87	338	8, 407	3	265	13	219	367	9, 043
1950	3	6	4	21	1	15	310	8, 930	21	1, 173	8	29	347	10, 174
1951	9	20	6	31	0	0	212	6, 046	15	867	12	218	254	7, 182

termined because the outbreaks were reported too late to be investigated, because samples of food could not be obtained, or because the investigation was not completed.

Shellfish

Shellfish were regarded as the source of infection in only one outbreak. Twelve cases of an unidentified type of infection followed the eating of hard-shelled clams. Improper and unsanitary handling of the clams in a restaurant was believed to be responsible for the outbreak rather than contamination at the source of supply.

Water

Bacteriological evidence of contamination or epidemiological evidence suggesting that water was the vehicle of infection was present in seven reported outbreaks of water-borne disease. In one instance, an estimated 3,500 persons in a Michigan town of 7,600 population became ill with diarrhea following a heavy rainstorm. Surface water had flooded the wells used as the public water supply. Samples of water taken 4 days after the storm showed no pathogenic organisms on bacteriological examination. Another outbreak of diarrhea followed the breakdown of chlorinating equipment of a well-water supply used by a summer hotel. During the breakdown, water was obtained from a spring known to be an unsatisfactory source of drinking water. A third outbreak occurred in a summer camp for children, where the piping system allowed inadequate contact of lake water with chlorine, and 60 to 80 persons became ill on two different occasions. No more cases occurred after the defect was corrected. Other outbreaks included a group of 300 cases of infection among persons who had used unchlorinated water from a spring reservoir known to be unsatisfactory, and a small group of cases among persons using water from a well having a high "coliform count." There was one outbreak of 18 cases of bacillary dysentery in which the infection was traced to a well in close proximity to a pit privy.

In none of the above outbreaks was an organism of the typhoid or *Salmonella* groups found or reported.

An unusual type of water-borne disease was reported in Oregon, where 22 persons using a swimming pool developed keratoconjunctivitis. Treated river water that conformed to accepted standards of purity for drinking water and amounts of residual chlorine was used in the pool.

Two outbreaks of infectious hepatitis were reported in which water was considered to be a possible mode of transmission, but proof was lacking.

Type of Agent

Staphylococcal Food Poisoning

In 63 outbreaks of food poisoning reported in 1951 the presence of a staphylococcus in the food was demonstrated by laboratory tests. Cream-filled pastries, mostly cream pies, cream puffs and eclairs, were the vehicles of infection in 18, or nearly one-third, of all staphylococcal food-poison outbreaks. Lack of or inadequate refrigeration was noted in 20 of the outbreaks, and in 3, the persons who prepared the food were reported to have "sores" on their hands.

Ham, usually baked, was also found to be the vehicle of infection in 27 outbreaks. In nine of these, inadequate refrigeration of the meat was noted.

In three outbreaks, milk or milk products were found to be contaminated with staphylococci. Four outbreaks were reported in which a salad was the vehicle of infection; in three of these, inadequate refrigeration was observed. Poultry meat (commonly turkey), salads containing such meat, and dressing used to stuff poultry, were reported in five staphylococcal food-poison outbreaks. A typical outbreak of this kind occurred in Wyoming. An auction sale of livestock was attended by 500 to 600 persons from three different States. Chicken salad sandwiches, prepared the day before the sale and left unrefrigerated, were served. Seventy-five persons became ill 2 to 8 hours after eating the sandwiches. On laboratory examination, *Staphylococcus aureus* was recovered from samples of this food.

A variety of meats, including roast beef, lunch meat, bologna, and pastrami, were also proved or suspected to have been the vehicles of infection in 38 outbreaks of food poisoning. Such an outbreak occurred in Connecticut following a banquet at which roast beef was served after being allowed to stand on top of a cooking range for 12 hours after roasting. An estimated 120 persons became ill, all of whom had eaten the roast beef. *Staphylococcus aureus* was found on culture of samples of the meat and in nose cultures of 10 food handlers who had had a part in cooking and serving it.

Peas and kippered herring, respectively, appeared to be the vehicles of infection in two outbreaks of staphylococcus food poisoning, according to reports of epidemiological investigations.

Typhoid Fever

Only three outbreaks of typhoid fever were reported in 1951. In one outbreak, 30 cases and 1 death occurred in an institution in New York State with a population of 375 inmates. Onsets of illness occurred over a period of 10 weeks, January 17 to March 28. While a common source of infection was suspected—food or milk contaminated during serving—this could not be proved, nor was the source of infection traced.

In Texas, an outbreak of 12 cases followed a banquet attended by 175 persons. Neither the vehicle nor the source of infection was identified.

In Oregon, raw milk supplied by a neighborhood dairy was the source of infection in two members of one family. The operators of the dairy, a man and his wife, were found to be carriers of the same phage type of organism, namely (F–1), as that isolated from these two patients.

In addition to the 44 cases cited above, there were slightly more than 2,100 cases of typhoid fever reported in the country as a whole in 1951. Many of these may have been infected by water, milk, or other foods, the real source of infection probably being a carrier having direct or indirect contact with these vehicles of infection. However, proof that a particular food or water supply is involved is difficult to establish when only one or two cases are associated with the presence of a carrier.

Salmonellosis

Fifteen outbreaks of *Salmonella* infections, with 850 clinical cases, were reported in 1951. Eight different types of the organism were found. *S. typhimurium* was isolated in six outbreaks, *S. oranienburg* and *S. montevideo* in two each, and *S. newport*, *S. dublin*, *S. give*, *S. morgani*, and *S. paratyphi B.*, in one each.

Poultry meat or eggs were found to be the vehicle of infection in 8 of the 15 outbreaks of

Salmonella infection. *S. typhimurium* was found in four outbreaks. Home-made ice cream in which duck eggs were used caused illness in 30 persons; turkey eggs were an ingredient of eggnog which was found to be the vehicle of infection in another epidemic due to *S. typhimurium*.

Ten cases of milk-borne *S. paratyphi B* infection were traced to the nephew of a dairyman. For about a week just prior to the epidemic the boy had visited the dairy farm and had helped in handling the milk, which was not subject to pasteurization. In 1948 this boy had been found to be a carrier of *S. paratyphi B*, and in 1950 there was evidence that he had been the source of infection of a case of salmonellosis in his home town.

Salmonella infection associated with poultry meat occurred in California. Forty-one of forty-six persons became ill from 3 hours to 3 days after a pre-Christmas buffet luncheon. *S. newport* was recovered from eight of the ill persons and from portions of cold sliced turkey, sliced tongue, and potato salad. The turkeys, the tongue, and the salad ingredients had been prepared by one person and had been sliced on the same board.

Spaghetti, chopped liver, baked ham, cream filling in chocolate eclairs, and baked Alaska also appear to have been the vehicles of infection in outbreaks of salmonellosis. In some instances the type of infection was established by isolation of the organism from stools of those who were ill.

Streptococcal Disease

Milk was incriminated in only one of the eight outbreaks of illness reported due to a streptococcus. One case of mastitis was found on a farm where milk supplied to a hospital was produced and pasteurized. Infection by a food handler in the hospital was also possible.

Many varieties of food were reported to be the vehicle of infection in outbreaks of streptococcal disease, but in several instances bacteriological tests were not conclusive. Although the vehicle of infection was not identified in an explosive outbreak of 150 cases in a hospital, a dietitian had a throat culture showing streptococci and a food handler had a sore throat just before the outbreak began.

Miscellaneous

Seven outbreaks of trichinosis were reported during the year, involving 32 cases with no deaths. Poorly cooked "local" pork, home-made sausage, and ham were reported as the types of pork eaten.

A chemical was considered to be the cause of illness in six reported outbreaks of food poisoning. In five instances, exposure of soft or fruit drinks to copper vessels or utensils was regarded as the probable means of contamination.

There were two reports of mushroom poisoning in which nine persons became ill and two died. Six children mistook the roots of water hemlock for an edible plant; three of the six died.

During the year nine reports of botulism outbreaks were received. Twenty cases and 12 deaths were reported. Type A and type B botulinus toxin were identified in two instances each. Home-canned vegetables were involved in seven instances, a commercially processed cheese in one, and an undetermined vehicle in one.

Six outbreaks of gastroenteritis, involving 398 persons, were reported. In four, an organism of the paracolon group was recovered from food samples; in two, *E. coli* was isolated in large numbers. In one outbreak, 93 of 155 persons attending a meeting on milk and food sanitation became ill after eating creamed turkey. Large numbers of aerogenes-like paracolon organisms were recovered. Of the other five outbreaks, turkey meat was involved in three, roast beef in one, and fruit cottage cheese in one.

Undetermined Vehicles of Infection

Ninety-two outbreaks of illness were reported in which no determination of type of infection could be made from the details recorded. When the 92 outbreaks were grouped according to incubation period, 44 fell into the group of "suspect" staphylococcal food poisoning; 36 had incubation periods of 8 to 24 hours or longer, suggesting food infection; and in 12, the incubation period was not reported.

In many instances, no laboratory examination was possible, because all suspected foods had been eaten or left-over portions had been

disposed of before the outbreak was reported. A typical report of this kind was sent from Maine. A family of 11 persons had eaten roast capon and a salad for Christmas dinner. Twenty-one to 24 hours later 8 persons were ill, but by the time the cases were reported for investigation none of the food remained. Stools of the patients showed no pathogenic organisms.

Other Types of Disease Outbreaks

Shigellosis

There was only one report of an outbreak of *Shigella* infection with definite evidence of transmission by food or water, and seven outbreaks were considered to be person-to-person types of infection. *Shigella sonnei* was isolated in six instances, and a flexneri type of organism in one. Four outbreaks occurred in institutions, one each in a summer camp and a school, and two were family outbreaks. In the eight outbreaks, 381 persons were reported to have been ill, the cause of 43 of the illnesses was confirmed by a laboratory examination of stools. In one epidemic of 153 clinical cases, the exact number confirmed by a laboratory test was not given.

Diarrhea of the Newborn

Five outbreaks of diarrhea of the newborn were reported, four in New York State, and one in Illinois. Fifty-four cases with two deaths were reported. The means by which the infection was introduced were not determined in any of the five outbreaks, although in two instances contact with an infected person was considered to be the most likely mode of spread. In one small outbreak of three cases, an organism of the *Salmonella* group was isolated from the stools of one infant, and a sample of the food formula yielded an aerobic spore-bearing organism. The outbreak in Illinois was explosive in character, and occurred simultaneously with reports of transient diarrhea in the general population served by a hospital.

Public Health Service Appointments

Three appointments in the Public Health Service have recently been announced.

Dr. Joseph F. van Ackeren was named chief medical officer of the Coast Guard, effective October 1, 1952, to succeed Dr. Paul M. Stewart, who has retired after 37 years with the Public Health Service. Dr. van Ackeren has served as medical officer in charge of the Public Health Service Hospital, Seattle, Wash., since 1944. His previous assignments include similar positions in the Public Health Service, Out-Patient Clinic, Washington, D. C., and in the Public Health Service Hospital, Baltimore, Md.

Dr. James Payson Dixon has been appointed acting assistant director of the Public Health Service's new 500-bed Clinical Center for research at the National Institutes of Health in Bethesda, Md. He has been health commissioner for Philadelphia since January 1952, as well as serving as professor of public health and preventive medicine at the University of Pennsylvania School of Medicine.

The new chief of the bacteriology laboratory of the Communicable Disease Center, Public Health Service, is Dr. Donald S. Martin, formerly dean of the University of Puerto School of Medicine. From 1932–50, Dr. Martin was on the faculty of the University of Rochester School of Medicine intermittently and on the faculty and staff of the Duke University School of Medicine and Duke Hospital. He succeeds Dr. Martin Frobisher, Jr., who has become chairman of the new department of bacteriology, University of Georgia, Athens.

The Local Public Health Officer in Great Britain Today

By SIR ALLEN DALEY, M.D., D.P.H.

The British public health service comprises about 2,000 full-time medically qualified health officers, the vast majority of the officers in local posts that between them cover the health needs of all parts of the country.

In addition, large numbers of medical officers have part-time work as specialists, clinic workers, and chest physicians in health departments and as officers in children's homes and welfare institutions.

Of the full-time officers, about 60 are in the Ministry of Health of England and Wales. The local health government in England and Wales has 145 major units—83 county boroughs and 62 counties—called the "local health authorities." Each has a medical officer of health—a term corresponding to health commissioner or health officer in the United States.

The 83 county boroughs, corresponding to cities, are "all purpose" authorities. Their health officers have responsibility for all the public health work of their cities, which range in population from just under 100,000 to more than 1,000,000.

Sir Allen Daley, a medical officer of health in England for more than 40 years and with the London County Council from 1929 until his retirement in February 1952, served as associate health officer of the Baltimore City Health Department from March to July 1952. He presented this paper before the health officers section of the Southern Branch of the American Public Health Association at the annual meeting in Baltimore, Md., April 17, 1952.

The 62 counties, responsible mainly for the personal health services such as maternity and child welfare and school health, have a complex system of health administration. Many are predominantly rural, cover wide areas, and contain a number of small towns. Others, like the London County Council, and the Middlesex County Council, which is on the fringe of Central London, are predominantly urban and have large populations.

Each county is subdivided into sanitary districts. Larger counties are also divided into divisions for health administration purposes.

In all of England and Wales there are 1,400 sanitary districts. The average number per county is about 17. But some of the small counties with populations of less than 100,000 have only two or three, and some of the larger ones with populations of more than a million have 40 or 50. Each of these sanitary districts must appoint, by law, its own health officer. He has responsibility, independent of the county health officer, for general sanitation, purity of food, and the control of infectious diseases.

To administer the divisions, the county appoints a divisional health officer who is on the staff of the county health officer and is subordinate to him. In counties with large populations or covering wide areas, such as London with its large population or Lancashire, which is more than 100 miles long, the counties have decentralized their functions, and it is now common for a district health officer to be also an assistant county health officer. This assignment gives him a full range of duties. He acts

independently as a district health officer for environmental hygiene, but as the agent of the county health officer for the personal health services in his area. The theoretical objection to his serving two or more masters is not serious in practice. This complication does not occur in the county boroughs (the large cities), where the health officer is assigned the whole field.

The London County Council

The health administration of the County of London is rather complex. This area of Central London, with its population of 3.5 million people is known as the London County Council, or the L. C. C. It has nine divisions for the purpose of county health administration, each with its divisional health officer responsible to the county health officer.

Within the same London County Council area there are 28 sanitary districts, or metropolitan boroughs as they are officially called, each with its own medical officer of health. Thus, a division includes from two to five sanitary districts. The districts (or boroughs) range in population from 30,000 to over 300,000. As so often happens, this disparity depends on history, the original boundaries dating back for centuries. In addition to the 28 sanitary districts, or metropolitan boroughs, there is, within the County of London, the ancient City of London with an area of 1 square mile, compared with 117 square miles in the County of London. It is, technically, a sanitary authority, though with wider functions than the 28 metropolitan boroughs, and its medical officer of health is always a senior and distinguished member of the public health service.

Outside the County of London there is the "overspill" population which, particularly during the past 50 years, has overflowed the boundaries of the London County Council. This overspill population is now about 6,000,000 and together with the County of London forms an urban aggregate of nearly 10,000,000 people, colloquially known as "Greater London." It is administered as one unit for police and traffic purposes, but no political party has had the courage to try to get sense into its problems of health administration, and the "outer fringe," as the area outside the County of London is called, contains three county boroughs, the county of Middlesex, portions of five other counties, and a host of sanitary districts.

Transfer of Functions

The trend is to transfer functions from the smaller district units to the larger county authorities, and from the large units—counties and cities—to the central government. For example, the maternity and child welfare work formerly done by the districts has been transferred to the counties, and all hospitals and the clinical part of tuberculosis and venereal disease work has been transferred from the counties to the central government.

The only functions now remaining with the districts are environmental hygiene in its broadest sense, and also the purity of water, milk, and food, the receipt of notifications of infectious diseases, and prevention of the spread of those diseases. There are encroachments even in this limited field. Generally, engineers are put in charge of water and sewage disposal undertakings and of the collection and disposal of garbage and trash for which many health officers were at one time responsible. Further, some counties, such as London, are given responsibility for major rehousing. In epidemiology, the district health officer must send to the county health officer copies of the notifications of infectious diseases within 36 hours of their receipt. In London, the County Council has power to step in and take over the work if the district defaults in its duty.

The counties have many important duties in the field of personal health. Maternity and child welfare includes receipt of notifications of birth, public health nursing, a midwifery service and antenatal clinics, infant welfare clinics, day nurseries, and recuperative holidays. Counties also provide school health service which, on the whole, is more highly developed than in the United States; vaccination, and immunization; a dental service for mothers and children; a home nursing and domestic help service; a general program of prevention and aftercare of all types of disease; an ambulance service not only for accidents but also for transport to and from hospitals; ascertainment and non-

institutional care of the mentally defective; a 24-hour service for taking into custody persons of disordered mind, and a host of other functions.

Impact of Nationalized Hospitals

In Britain, it is common form to administer by the horizontal, as opposed to the vertical system—that is, the lawyer, the doctor, the engineer, and the architect do the legal, medical and nursing, the engineering and the building work for the entire local government unit. By contrast, in the vertical system, the education department, for example, would have its own doctor and architect on the staff of the education officer or superintendent of schools. Under the horizontal system, the functions of health officers, who had responsibility for the municipal hospital service, were expanding somewhat rapidly until the hospitals were nationalized in 1948.

Some health officers transferred to administrative positions in the hospital service. Most, however, remained in the health service, and many regarded the nationalized hospital service as a major inroad on local health administration. Although the advantages to the local health officer of direct control of communicable disease hospitals and sanatoriums, and of all the work of tuberculosis dispensaries and venereal disease clinics are obvious, it is not so clear that he need concern himself with the details of the administration of general or mental hospitals. There is, however, still much important work for the health officer to do. He must study morbidity in his area and see what can be done to reduce it, particularly that due to psychoses and psychoneuroses. The cost of the curative services is heavy and it is obvious that preventive measures must be supported to an increasing extent.

The importance of "social medicine" is being recognized. Problems of the care of the aged now face the health officer. In some areas, the health officer has been appointed welfare officer as well because the care of the aged and infirm interlocks with medical and nursing problems.

The recent changes, however, have had an unsettling effect on the public health service, and a couple of years ago only a handful of students in the schools of public health expressed a desire to become health officers in Britain. Most of the public health students were destined for the colonial services or the medical departments of the armed forces.

Until World War II, there was no shortage of good recruits for the health departments. Apart from those attracted to this work for its own sake, some entered it because it gave a salaried post on a full-time basis to a man without the capital then necessary to buy a general practice or on which to keep himself while preparing for a specialist career. With the advent of the National Health Service Act, all this has changed. The sale and purchase of general practices has been prohibited by law, and, except for the purchase of a house, capital is not now needed to set up in practice. Interns and residents are paid a living wage; specialists are paid for their hospital work and at a level substantially above that of the average full-time health officer.

Salaries Fixed

Before the war, health officers were reasonably content with their salaries. Although a minimum salary for each type of post had been settled on a national basis in 1929, there was local option, and in many areas much more was paid than the minimum. The National Health Service Act provided that the Government would reimburse local health authorities half the salaries of their medical staffs. The counties always had paid half the salaries of the district health officers. The act, therefore, gave the Government greater control over salaries, and committees were set up to fix salaries of medical and nursing staffs on a national basis. The employing and the staff sides could not agree. The health officers maintained that they and their assistants were specialists and should be paid the same as hospital specialists. The employers said:

> Medical administrators' salaries should be similar to those of other professional administrators in the local government service, such as the finance officers, engineers, and architects. Local governments would have to increase substantially the pay of all their professional staffs if the doctors' rates of pay went up to the hospital scales and local governments could not afford it.

Many assistants in the health departments were doing medical work more analogous to that of the general practitioner than of the clinical specialist.

The dispute finally went to arbitration, and, by and large, the arbitrator agreed with the employers. Apart from the largest cities and counties, health officers' salaries are lower than those of clinical specialists, and those of assistant health officers and directors of bureaus are substantially lower than those of similar grades in hospitals. Salaries of the heads of the departments are based on the populations of their areas, although some discretion is given depending on the range of duties. It is only in the largest cities with populations over 600,000 that complete discretion as to the rate of pay is given. The staff side had felt that in small areas the employers could not be trusted to pay reasonable salaries unless they were forced to do so by the National Government but that in large areas the employers could be relied upon to pay enough to attract a good man. Many health officers received increases of pay as a result of the award, but the standard pay for new entrants to the service, which cannot be exceeded, is unattractive. The deputies of health officers receive two-thirds of the salaries of their chiefs.

The entrants to the service are supposed to have had at least 3 years of medical work after graduation and to have taken the diploma in public health, but many now, particularly those engaged in school health and clinic work, have had no specialized public health training, and are, therefore, ineligible for posts of health officer. More and more of those now entering the service are married medical women who use this as a method of augmenting the family income.

In my opinion, the salaries of medical officers of health are sufficient to attract good people, but unless the pay in the lower ranks is increased Great Britain will soon be short of men qualified to fill the senior posts.

Nonpolitical Appointments

A senior public health officer usually has done 2 or 3 years' hospital work after graduation—often he has also had a period of general practice. He has taken the diploma in public health after a year of academic work at his own expense. He has entered the service as an assistant medical officer of health, doing school health, or maternity and child welfare, or chest clinic work. He has moved about the country, paying his own removal expenses, gaining experience in different fields and different areas, and has obtained, eventually, the post of medical officer of health of a small city or county. The posts are usually advertised, and he progresses to larger cities or counties, taking his pension rights with him.

The actual appointments are made by the city or county councils concerned, after interviewing selected candidates. Canvassing, direct or indirect—that is, the seeking of support by influence—disqualifies. Allegiance to any political party is frowned upon, and health officers take no part in politics, serving with equal loyalty any political party elected by the people.

The mayors of cities and chairmen of county councils are unpaid. They, too, are above politics during their term of office, which is usually for a year only. They are the social, and not the political, leaders of their communities and preside over the meetings of their councils.

The chief officers of local government, such as the health officer, report to committees of the council, and policy and finance are in the hands of these committees, the members of which are unpaid. The majority party appoints a "leader of the council" and the minority a "leader of the opposition." The town clerk or county clerk, a lawyer, coordinates the work of the various departments. He corresponds to a mayor or governor in the United States, except that he is nonpolitical; he does not decide policy or finance or make appointments—these are the functions of the elected members who operate through committees—and he remains in office until he goes to another area or retires on reaching the age limit.

Summary

1. Until World War II, the public health service in Britain was an attractive career, reasonably paid, and contained men who had the confidence of their councils and of the medical profession.

2. They had heavy responsibilities, including the administration of hospital services.

3. Since the National Health Service Act nationalized hospitals, there are no municipal hospitals under local control, and hospital clinicians receive better salaries than public health workers.

4. The fixation of rates of pay on a national basis has not been an unmixed blessing. The profession wanted fixed rates so that local governments would be required to pay reasonable salaries, but they wanted minimums only to be fixed. Arbitration of the issue fixed maximums as well, except for the chief health officers of the largest authorities. This has meant that some officers are not receiving as much as they would have received had the local government units been free to pay what they liked.

5. Some feel that, since the main problems of environmental hygiene have been dealt with and free medical treatment by general practitioners and hospitals is available for all, there is little for the health officer to do.

6. My own view is that, despite the undoubted contraction in some fields, there are new and important functions unfolding, such as looking beyond the confines of epidemic diseases, considering all forms of morbidity, and devising methods of reducing or preventing them. Preventive work should include methods of rehabilitation and aftercare, and the education of the public in such matters, for example, as the prevention of accidents in the home. Psychiatric illness and the problems of old age and chronic sickness must be tackled. Health officers also have important functions as liaison officers between the various branches of the health service, that is, the hospital and general practitioners' services. To be successful they must have good standing in their profession. All this is in addition to the duty of controlling the spread of infectious diseases for which a trained epidemiologist is essential.

7. In contrast with conditions in the United States:

The health officer is never a political appointee. He is a career officer who remains in office despite changes in local political power. Incidentally, a British health officer has security of tenure and cannot be discharged except with the concurrence of the National Ministry of Health.

Except at the London School of Hygiene, I doubt if the academic training of public health officers in Great Britain is as good as in the United States.

Even with the loss of hospital administration, the British health officer's range of duties in a local health unit is somewhat greater than in the United States. However, the combining of sanitary districts and participation in the work of the county are essential to attract and keep good men.

Trained health officers serve all parts of Britain.

When a British health officer moves from one authority to another, or to or from a university or hospital appointment, he takes his pension rights with him.

The British health officer is responsible not to one man, the mayor or governor as in the United States, but to the city council or county council as a whole.

Generally, there is a uniform standard of salary for similar posts throughout Great Britain.

8. The points of similarity are:

The senior posts, particularly in areas where there is continuity of service, are held by first class, experienced, and respected health officers.

There is a shortage of good candidates for the junior posts associated, in both countries, with inadequate pay, and due, in both countries, to linking rates of pay with those of other local government officers and not with those of other physicians.

Reported Tuberculosis Morbidity

United States, 1949-1951

By ROBERT J. ANDERSON, M.D., and HERBERT I. SAUER, B.A.

The effective and economical operation of a tuberculosis control program depends upon adequate knowledge of the extent and character of the services needed. One useful source of such information is newly reported tuberculosis cases—those cases which first become known to the health department—and the variations in some of their characteristics from State to State.

As with the other communicable diseases, the objectives of tuberculosis morbidity reporting are ordinarily considered threefold:

1. For protection of the health of the patient's family and the community.
2. For aiding in providing better care to individual patients.
3. For statistical and administrative purposes.

The last point is the primary concern of this paper. Our data are based on information from the semiannual tuberculosis reports, the National Office of Vital Statistics special report on notifiable diseases, 1947–50, and other reports provided by the various States.

Morbidity statistics may be used for a number of purposes, among them measurement of the extent of the tuberculosis problem and trends therein, the distribution of the disease, geographically and by other characteristics, and the success of the control program in reducing the problem, particularly the success of case finding. Figures on morbidity reporting are sometimes used in apparently contradictory ways. For instance, increases in morbidity reporting may be interpreted as an indication of improved case finding, but decreases may be interpreted as an indication of decreased incidence or occurrence of the disease. Care must therefore be taken in interpreting morbidity reports lest unwarranted conclusions be drawn. The reasons for changes in reported morbidity cannot be ascertained from an examination of the figures alone. A knowledge of the actual operation of the control program and of some of the underlying conditions affecting reporting is necessary for interpretation of the data.

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New Cases Reported in 1951

The total of 118,491 tuberculosis cases newly reported in the United States in 1951 (that is, reported for the first time) is slightly less than that for 1950 and represents a decline of 13.0 percent from the 1947–48 high. The decline in the rate of new cases reported per 100,000 population was 17.8 percent: from 94.0 in the 1947–1948 period to 77.3 in 1951.

The decrease in numbers of tuberculosis cases newly reported in the United States during the past several years has not been uniform for all States (table 1). Eleven States showed increases in the number of cases reported in 1951 as compared with the 1947–48 average, while the remaining States showed decreases. Several of the States showing increases were among those with low levels of reporting in 1947–48. Sixteen States, the District of Columbia, and the Territory of Hawaii showed decreases of more than 20 percent. For most of the States

Table 1. Tuberculosis cases newly reported, 1951, and percentage change from 1947–48 average, United States, each State and Territory

State	New cases reported 1951	Percent change as compared with 1947–48 average
Total, continental United States	118,491	−13.0
Alabama	2,661	−8.6
Arizona	3,772	+66.1
Arkansas	2,174	−0.6
California	8,426	−7.0
Colorado	1,669	+2.6
Connecticut	1,515	+8.4
Delaware	273	−5.9
District of Columbia	1,907	−46.4
Florida	2,590	−32.3
Georgia	2,502	−22.2
Idaho	237	+25.4
Illinois	6,949	−5.8
Indiana	2,032	−19.8
Iowa	829	−11.7
Kansas	562	−46.7
Kentucky	3,429	+65.3
Louisiana	2,639	−14.8
Maine	450	−13.8
Maryland	2,687	−11.8
Massachusetts	2,293	−18.4
Michigan	6,144	−2.3
Minnesota	2,208	−35.4
Mississippi	1,444	−33.0
Missouri	2,658	−6.9
Montana	320	−48.3
Nebraska	297	−36.9
Nevada	215	+27.6
New Hampshire	207	+30.2
New Jersey	3,246	+3.0
New Mexico	767	−48.3
New York	12,129	−8.9
North Carolina	3,106	−9.5
North Dakota	218	−32.0
Ohio	7,351	−15.7
Oklahoma	1,763	−26.3
Oregon	765	−10.8
Pennsylvania	6,220	+17.1
Rhode Island	394	−31.7
South Carolina	1,268	−18.7
South Dakota	261	−7.4
Tennessee	3,552	−37.5
Texas	4,415	−35.3
Utah	231	+100.0
Vermont	263	−8.2
Virginia	3,804	−6.1
Washington	2,046	−24.9
West Virginia	1,806	−24.4
Wisconsin	1,706	−31.9
Wyoming	91	+62.5
Alaska	589	−4.8
Hawaii	551	−58.8
Puerto Rico	6,075	−11.7

showing major changes, the increase or decrease appears to be due in part to changes either in administrative procedures or in the extent of X-ray and other case-finding activities in the State.

Factors Influencing Reporting

The level of morbidity reported is influenced by three broad groups of factors:

1. The number of new cases developing during the year, together with the number of unknown cases existing at the beginning of the year.
2. The success of efforts to find these cases.
3. The completeness of reporting diagnosed cases to the health departments and the types of cases which are included in compilations of morbidity by those departments.

Changes in numbers of cases reported from year to year and variation from area to area may be due to changes or variations in any one or a combination of the above factors. These factors will be considered in reverse order in relation to the 1947–51 data.

There are variations among the States in the types of tuberculosis cases which are reported. In some States—for example, California and Massachusetts—the usual practice is to count active cases only, while some other areas include in their counts cases of borderline significance. Such differences in procedures have been described (*1*) and recommendations have been made and adopted by the State tuberculosis control officers (*2*) for further improving the usefulness of morbidity reporting in tuberculosis, particularly for counting the active and probably active cases separately from other reportable cases. Available information indicates that as much as one-fourth of the decline from 1947–48 to 1951 may be due to the decreases in the reporting of arrested cases.

Completeness of reporting also varies from area to area. While it is a truism that 100-percent reporting is ordinarily impractical it is possible to approach completeness. For example, in some areas more than 90 percent of persons dying from tuberculosis are reported cases prior to death, while in other areas only about 50 percent of these deaths are so reported. Those communities reporting practically all of

their cases prior to death are more nearly approaching complete reporting than those which report only half of tuberculosis decedents as living cases.

Examination of morbidity figures by source of report shows that reports from all major sources declined in the period under consideration. It would not therefore appear that changes in completeness of reporting from any one source would account for the 13-percent decline in reported cases from 1947–48 to 1951.

Efforts to find cases have apparently not fallen off in the United States as a whole since 1947 (*3*). In fact, the number of X-rays taken in case-finding programs in 1951, although less than in 1950, was 2½ million more than the annual average for 1947–48. In some States, however, changes have occurred. For some, more extensive case-finding activities have resulted in increases in the number of cases found. For a few States, the decreases appear to be due, in part at least, to less extensive case-finding activities. For example, the District of Columbia had a community-wide survey in 1948 which resulted in an unusually large number of new cases being reported; the number of X-rays taken in 1951 and therefore the number of new cases reported in that year are substantially below the 1947–48 level, although they are still above the average for the United States.

Since other factors will apparently thus account for only a relatively modest portion of the decline in the total number of newly reported cases for 1951 as compared with 1947–48, it seems reasonable to infer that there has been a decrease either in the number of new cases of tuberculosis developing each year or in the number of unknown significant cases existing in the population, or in both.

In order to emphasize that it is the number of known cases that determines the amount of tuberculosis services to be furnished by the tuberculosis control program, it must be mentioned that there does not appear to be any appreciable decline in the number of known cases of tuberculosis. This is probably due to two factors: With more extensive case finding in recent years, a higher proportion of the cases are known; and with improved therapy patients are living longer.

Cases per Death

Case finding and reporting have been generally recognized as essential steps in tuberculosis control. If the number of cases which occur were known, the completeness of case finding and reporting could be measured by the ratio of cases found and reported to the total cases occurring. Obviously we do not know how many cases occur and are undiscovered, so the number of deaths from tuberculosis has been used as an index of the occurrence of the disease. The ratio of cases reported per death has therefore been used rather generally to measure the relative extent of case finding and reporting.

The ratio of newly reported cases per death has risen from approximately two per death in 1941 to four new cases per death in 1951, and has risen steadily every year since 1947 (table 2). Improved case finding and reporting appear to be responsible for a part of this increase, although the decline in mortality has played a large part. For purposes of comparison, all the following computations of the ratio of new cases per death have been based upon the average number of tuberculosis deaths for the latest available 3-year period by State, that is, for 1947–49.

Table 2. Newly reported tuberculosis cases, cases per death, and rate per 100,000 population, United States, 1947–51

Year	New cases reported	New cases per death	New cases per 100,000 population
1947	135, 118	2. 8	94. 2
1948	137, 192	3. 1	93. 9
1949	134, 865	3. 4	90. 8
1950	121, 636	[1] 3. 6	80. 4
1951	118, 491	[1] 4. 0	77. 3

[1] Based upon tuberculosis deaths estimated by NOVS from 10-percent sample.

It must be remembered, however, that this ratio is affected by the case fatality rate, varying inversely with it; the higher the case fatality rate, the lower the case-death ratio and vice versa. That is, as more patients recover instead of dying, the ratio will be higher. Thus, further stress is placed upon the desirability

of a high ratio of new cases per death, indicating better case finding and reporting and/or lower case fatality. In some instances, however, variation in case-death ratios are due, in part at least, to variations in reporting practices.

Table 3 shows the 1949–51 averages of newly reported cases by State, together with the ratios of new cases per death. The 3-year average has been used to minimize fluctuations due to the effects of mass X-ray surveys, changes in reporting practices, and other variables. For the various States, new cases reported per death range from 1.8 to 6.5, with an average of 2.9 for the country as a whole. The northeastern States tend to have lower ratios than do other areas (fig. 1), while the 11 western States as a group have higher ratios, as do also the central States along the northern border of the country. There is, however, a substantial variation in the ratios from State to State within each region.

Race and Sex

During the period under study, the tuberculosis death rate among nonwhites was approximately three and one-half times the rate among whites. In view of this marked difference, it is important to consider differences by race in cases reported. The 1949–51 summaries of newly reported cases by race and sex for 46 States and the District of Columbia show rates per 100,000 population (1950 census) as follows:

	Total	*Male*	*Female*
White	71.7	90.5	54.6
Nonwhite	179.1	203.9	153.9

Thus the rate of newly reported tuberculosis cases among nonwhite persons was approximately two and one-half times that among white persons. In both groups the rates are higher among males than among females.

The latest 3-year period for which complete mortality tabulations are available by race and sex is 1947–49; using these mortality data, the ratios of newly reported tuberculosis cases per death, by race and sex, are:

	Total	*Male*	*Female*
White	3.2	2.9	3.8
Nonwhite	2.2	2.2	2.2

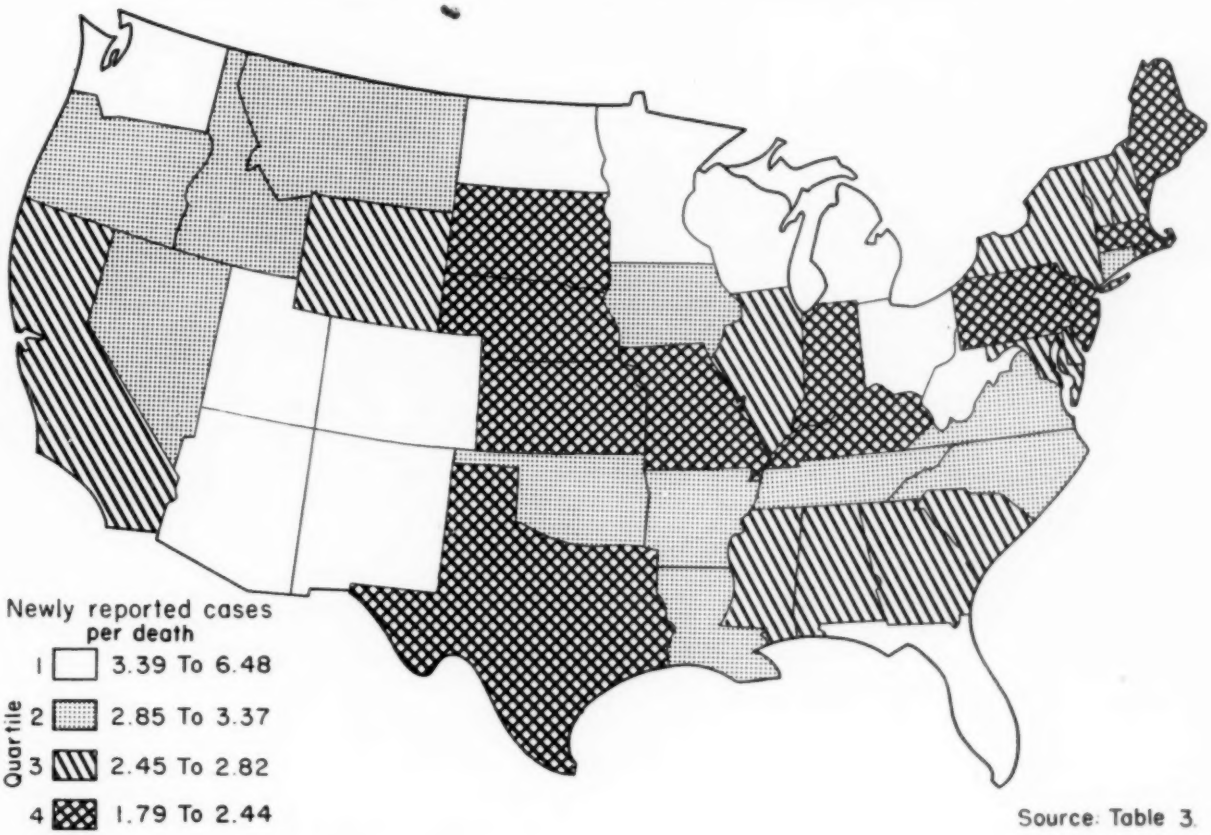
Table 3. Tuberculosis cases newly reported, 1949–51 average, ratio per death and rate per 100,000 population, United States and Territories

State	New cases reported 1949–51 average	New cases reported per death [1]	New cases reported per 100,000 population [2]
Total, continental United States	125,033	2.9	82.7
Alabama	2,793	2.7	91.2
Arizona	2,942	5.0	390.2
Arkansas	2,120	2.9	110.8
California	8,681	2.7	82.0
Colorado	2,111	6.5	157.7
Connecticut	1,425	2.9	70.8
Delaware	300	2.5	94.1
District of Columbia	1,723	3.8	218.1
Florida	2,708	3.7	97.1
Georgia	2,787	2.8	80.6
Idaho	220	3.3	37.2
Illinois	7,512	2.8	85.8
Indiana	2,224	2.4	56.3
Iowa	859	3.2	32.6
Kansas	612	2.3	31.9
Kentucky	3,125	2.3	105.7
Louisiana	2,647	2.9	98.5
Maine	472	2.4	51.3
Maryland	2,728	2.6	116.0
Massachusetts	2,458	1.8	52.3
Michigan	5,879	3.8	91.9
Minnesota	2,559	5.3	85.2
Mississippi	1,852	2.8	84.9
Missouri	2,729	2.4	68.7
Montana	411	3.0	68.7
Nebraska	310	1.8	23.2
Nevada	180	3.1	112.7
New Hampshire	183	2.4	34.1
New Jersey	3,408	2.4	70.0
New Mexico	1,035	3.4	149.8
New York	12,845	2.6	86.1
North Carolina	3,387	3.3	83.0
North Dakota	252	3.5	40.3
Ohio	8,558	3.9	107.5
Oklahoma	2,065	3.4	92.5
Oregon	749	2.9	49.1
Pennsylvania	5,993	1.9	56.8
Rhode Island	457	2.3	58.0
South Carolina	1,326	2.5	62.5
South Dakota	287	2.2	43.5
Tennessee	4,461	3.2	135.3
Texas	4,966	1.9	64.3
Utah	270	3.9	38.8
Vermont	307	2.8	80.7
Virginia	3,625	3.3	109.4
Washington	2,317	4.3	97.3
West Virginia	2,121	3.5	105.5
Wisconsin	1,972	3.9	57.1
Wyoming	82	2.7	28.3
Alaska	720	3.1	559.5
Hawaii	634	3.6	126.9
Puerto Rico	6,391	1.7	289.1

[1] 1947–49 average number of tuberculosis deaths.

[2] Population sources: For continental United States—July 1, 1950, Bureau of Census reports. For Territories—Apr. 1, 1950, Bureau of Census reports.

Figure 1. Tuberculosis cases newly reported per death, United States, 1949–51.



Source: Table 3.

The high ratio of new cases reported per death for white females may mean that case finding and reporting are more effective among them than among white males, or it may be due to the fact that white females have lower death rates than do white males. Information from specific communities indicates that both factors are of importance.

Because tuberculosis is known to be more frequently fatal among nonwhites and because arrested tuberculosis is less frequently discovered in surveys among this group, one would expect to find a lower ratio of new cases per death in nonwhites than in whites. It is difficult, therefore, to compare case finding and reporting among nonwhites with that among whites on the basis of case-death ratios.

The ratio of new cases reported per death for each race varies from State to State (table 4) and from region to region, as is seen in the following summary table.

Region	*New cases per death*	
	White	*Nonwhite*
Northeast	2.3	2.4
South	3.8	1.9
North Central	3.4	2.6
West	3.5	3.0
Total	3.2	2.2

For whites, the South has the highest ratio of reporting; the Northeast the lowest. For nonwhites, the West has the highest level of reporting; the South the lowest. The Northeast has a slightly higher ratio for nonwhites than for whites, while the West and North Central States as a group have a ratio of reporting for nonwhites approximately four-fifths as high as for whites. The ratio of new cases per death for nonwhites in the South is only half that for the whites. Part of the explanation of the lower ratios of reporting for nonwhites may lie in the practice of reporting probably inactive cases and the generally recognized smaller number of arrested cases among nonwhites.

Table 4. New tuberculosis cases reported and cases per death by race and State, 46 States, District of Columbia, and Territories, 1949–51 average

State	New cases reported [1]		New cases per death [2]	
	White	Non-white	White	Non-white
Total, 46 States and District of Columbia	89, 767	26, 221	3. 2	2. 2
Alabama	1, 740	1, 052	3. 8	1. 8
Arizona	2, 426	403	5. 8	2. 4
Arkansas	1, 615	496	3. 6	1. 8
California	7, 248	1, 626	2. 7	3. 3
Colorado	2, 239	89	7. 4	3. 9
Connecticut	1, 224	107	2. 8	2. 1
Delaware	223	77	2. 9	1. 7
District of Columbia	838	828	5. 6	2. 7
Florida	2, 031	659	5. 8	1. 7
Georgia	1, 654	1, 140	4. 2	1. 9
Idaho	124	27	2. 1	[3]
Illinois	5, 605	1, 888	2. 9	2. 5
Indiana	1, 843	298	2. 4	1. 8
Iowa	669	45	2. 6	[3]
Kansas	554	71	2. 5	2. 0
Kentucky	2, 699	287	2. 4	1. 2
Louisiana	1, 560	984	3. 8	2. 0
Maine	478	1	2. 5	[3]
Maryland	1, 797	932	3. 4	1. 8
Michigan	4, 516	1, 412	4. 0	3. 3
Minnesota	2, 399	84	5. 3	3. 0
Mississippi	924	838	4. 3	1. 9
Missouri	2, 124	396	2. 5	1. 5
Montana	308	94	3. 4	2. 1
Nebraska	293	16	2. 0	. 6
Nevada	163	3	3. 7	[3]
New Hampshire	183	0	2. 5	[3]
New Jersey	2, 627	683	2. 5	2. 0
New Mexico	857	178	3. 8	2. 2
New York [4]	9, 593	3, 244	2. 5	2. 8
North Carolina	2, 009	1, 382	4. 9	2. 3
North Dakota	196	48	3. 3	[3]
Ohio	6, 945	1, 612	4. 4	2. 8
Oklahoma	1, 701	353	3. 9	2. 0
Oregon	686	57	2. 9	2. 3
Pennsylvania [4]	4, 375	1, 437	1. 9	2. 0
Rhode Island	391	29	2. 2	1. 6
South Carolina	703	621	4. 4	1. 7
South Dakota	173	114	2. 5	1. 9
Tennessee	3, 556	802	3. 6	2. 0
Utah	230	43	4. 0	[3]
Vermont	307	0	2. 8	[3]
Virginia	2, 479	1, 091	4. 4	2. 0
Washington	1, 867	306	4. 0	3. 9
West Virginia	1, 924	211	3. 7	2. 3
Wisconsin	1, 602	129	3. 4	4. 6
Wyoming	69	28	2. 8	[3]
Alaska	56	683	2. 4	3. 3
Hawaii	75	647	4. 5	4. 1
Puerto Rico	5, 484	808	1. 9	1. 0

[1] From semiannual tuberculosis reports only, excluding cases with race not specified. The sums of white and nonwhite cases by State are frequently not identical with the latest available totals presented in table 3.

[2] Based upon latest available 3-year average of deaths by race, 1947–49.

[3] Ratios not computed for States having fewer than 50 nonwhite tuberculosis deaths in the 3-year period.

[4] 2-year average.

Fourteen States and one Territory had ratios of four or more new cases reported per death for whites, while only one State and one Territory had a ratio this high for nonwhites. Wisconsin, California, New York, Pennsylvania, and Alaska had slightly higher ratios among nonwhites than among whites. It would thus appear that the latter group is possibly placing greater emphasis upon their program of case finding and reporting among nonwhites than among whites.

Source of Report

The source of the report of cases was available for 44 States and the District of Columbia for the period 1949–51. During this period, private physicians reported about 51,000 new cases or 15 percent of the total (fig. 2). Idaho was first in the proportion of new cases reported by private physicians with 71 percent, while Montana was second with 53 percent. Other States in which more than 30 percent of cases were reported by private physicians were Utah, North Dakota, Oregon, Minnesota, Kentucky, Kansas, Nevada, and Wyoming.

Forty percent of the new cases were reported by chest clinics (fig. 2) and 24 percent by general hospitals and tuberculosis hospitals combined. In some areas, private physicians refer substantial numbers of tuberculosis suspects to chest clinics for completion of clinical study and diagnosis. A low percentage of reports from physicians and a correspondingly high

percentage from clinics should not therefore automatically be construed as evidence of poor cooperation from physicians.

Reporting of tuberculosis by mental institutions has not improved appreciably. For the period 1949–51, less than 3 percent of all new cases were reported by mental institutions, although 8 percent of tuberculosis deaths occurred in such institutions. In spite of a decrease in the number of States which report no tuberculosis cases, or practically none, from mental institutions, there were still a dozen such States in 1951. It is possible that the tuberculosis cases were all diagnosed and reported prior to admission of the patients to mental institutions and that no cases developed while in these institutions. Information from other sources, however, indicates that limited case finding and reporting are more important factors. There is also the possibility that the cases reported by mental institutions are counted as coming from hospitals and other sources. Whatever the explanation, it would seem that the health departments for States with practically no tuberculosis reported from mental institutions are not receiving information needed for directing their tuberculosis control programs in these institutions.

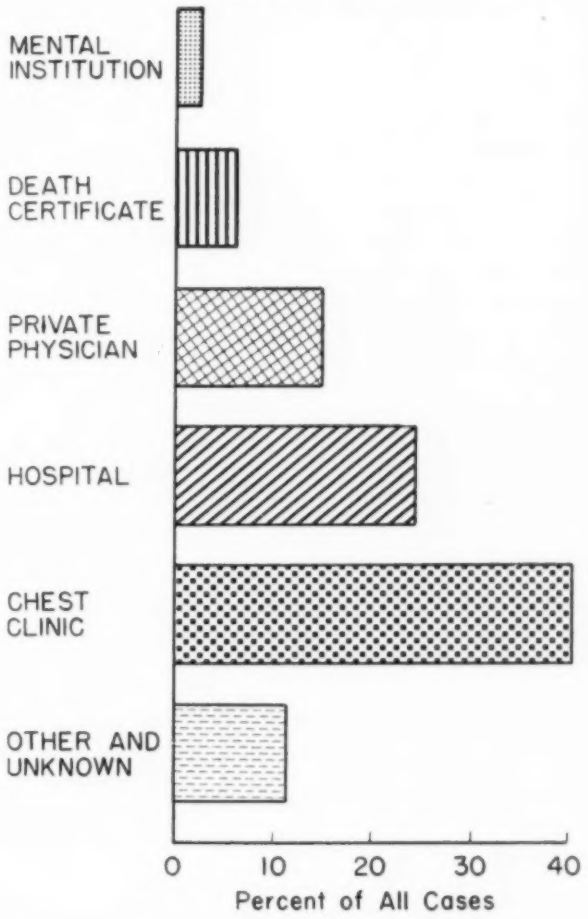
Approximately 11.5 percent of newly reported cases were from sources classified as "Other and unknown"; most of these reports were from Veterans Administration, other Federal agencies, and from notifications of patients moving into one State from another State.

As was mentioned above, there was a decline in cases reported from each of the major sources from 1947–48 to 1951. Cases reported by hospitals declined 11 percent; by clinics, 16 percent; and by private physicians, 30 percent.

New Reporting Procedures

The need for more uniformity in tuberculosis morbidity reporting has been described elsewhere (*1*) and in a preceding paragraph reference has been made to the new reporting recommendations adopted by the State tuberculosis control officers and sanatorium directors (*2*). On the basis of these recommendations, the annual and semiannual tuberculosis reports requested by the Public Health Service from each State and Territory have been revised, effective January 1952. Seven States (Arizona, Arkansas, California, Iowa, Michigan, Oklahoma, and Rhode Island) and the

Figure 2. Source of report of new tuberculosis cases, 1949–51.



District of Columbia provided data on the number of newly reported tuberculosis cases for the year 1951 essentially in accord with the new plan, while Nevada and Tennessee provided such data for the last 6 months of 1951. One State explained that the decline in new cases reported in 1951 was largely due to the application of the new recommendations. In this group of States, approximately three-fourths of the cases reported were active and probably active (group A) cases. The proportion of active cases varied from less than half in one State to practically all cases in another.

We feel that the State tuberculosis control officers and State sanatorium directors are to be

congratulated for their development of the new reporting recommendations. The application of these recommendations will provide each health department with more specific information regarding the number of people sick with tuberculosis who are just becoming known to the health department. Each community will thus be able to plan more effectively and more economically for the operation of its program.

Summary

1. The statistical and administrative uses of tuberculosis reporting are the measurement of the extent of the tuberculosis problem and the trends therein, the distribution of the disease, geographically and by other characteristics, and the success of the control program in reducing the problem, particularly the success of case finding. Care must be taken in interpreting morbidity reports, since variations in reporting levels may reflect not only changes in the actual number of cases, but the success of case-finding efforts and reporting practices.

2. In 1951, 118,491 new cases of tuberculosis were reported in the United States, a decline of 13.0 percent from the 1947–48 peak. This is four times the number of tuberculosis deaths, or a ratio of four new cases reported per death, the highest ratio for any year since reports have been tabulated.

3. The ratio of new cases reported per death is substantially higher for whites than for nonwhites. Regionally, the South had the highest ratio of reporting for whites, and the lowest ratio of reporting for nonwhites.

4. Of the total new cases reported during 1949–51, about 40 percent were reported by chest clinics, 25 percent by hospitals, and 15 percent by private physicians. Less than 3 percent of the new cases were reported by mental institutions, although 8 percent of the tuberculosis deaths occur in such institutions.

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(*1*) Northrop, Cedric, Anderson, Robert J., and Sauer, Herbert I.: What is a reportable case of tuberculosis? Pub. Health Rep. **64**: 961–968 (1949).

(*2*) U. S. Public Health Service: What is a reportable case of tuberculosis? Pub. Health Rep. **66**: 1291–1294 (1951).

(*3*) Enterline, Philip: Group chest examinations and the tuberculosis death rate. Pub. Health Rep. **67**: 762–766 (1952).

National Science Foundation Fellowships

The National Science Foundation, Washington, D. C., in its graduate fellowship program for the academic year 1953–54, will offer awards to medical students who are interested in careers in medical research. The fellowships range from $1,400 for first-year fellows to $3,400 for postdoctoral fellows. No awards will be given for study in clinical medicine.

The Health Department and Poliomyelitis

Administrative factors in the 1952 outbreak in Wayne and Medina Counties, Ohio

By EARL E. KLEINSCHMIDT, M.D., Dr. P.H., MABEL ABBOTT, M.P.H., and E. ILAH KAUFFMAN, R.N.

Wayne and Medina Counties in Ohio have experienced an unprecedented outbreak of poliomyelitis this year. The first case was reported in March, and by September 15 the total number of confirmed cases had mounted to 234, a case rate of 229 per 100,000 population (estimated population of the two counties, July 1, 1952, 102,077). Although it is yet too early to know what the final count will be, it is fair to assume on the basis of existing evidence that the peak of the epidemic has been passed.

Evidence that 1952 would be an epidemic year in these two counties was suggested by the late occurrence of cases in 1951 and the early appearance of cases in 1952. When it became evident that the potential threat implied by these observations was real, a plan of action was set up and has been followed consistently during the entire epidemic.

Alerting the Public

In June, conferences were held with the editors of all newspapers in the two counties for the purpose of explaining the nature of the disease and the health department plans for meeting the impending emergency. As a result, the health officials have enjoyed excellent cooperation by the press and the full confidence of a majority of the reading public.

Early in the course of the outbreak, representatives of the Ohio Department of Health were invited to review the situation with local health officials. Their views of the local situation were given wide publicity over the radio and in local newspapers. This measure proved to be of inestimable value in assuring an uneasy populace of the efficacy of measures advocated by the local health departments.

Representatives of the Summit County Chapter of the National Foundation for Infantile Paralysis rushed large quantities of popular literature to the two county health departments, which were distributed by staff nurses to each household where cases occurred and to threatened areas as well. Large quantities of literature were also distributed by village and city councils, service clubs, and other civic organizations, and additional supplies were left in drug and grocery stores.

Early in June a daily radio program was arranged over a local radio station in Wayne County. The program took the form of informal interviews and, where possible, included discussions with visiting officials from the Ohio Department of Health, the National Foundation for Infantile Paralysis, and other professional groups. A concerted effort was made to give the public the facts about the disease and an account of measures being carried out to control it. Fan mail indicated that the programs had a receptive audience.

Dr. Kleinschmidt is health commissioner of the Wayne and Medina General Health District; Mrs. Abbott is supervising nurse in the Medina County Department of Public Health, and Miss Kauffman holds a similar position in the Wayne County Department of Public Health.

Meetings were held with each village and city council in the threatened areas and recommendations made concerning control measures. No attempt was made to gloss over the inadequacies of existing methods of control. Inevitably, one or more members of each council would urge that strict quarantine measures be enforced as a means of combating the spread of the disease. In one instance, despite advice to the contrary, officials of a village saw fit to oil all ditches, spray the entire village with DDT, and install sewer tile where open drainage ditches had previously existed in order to satisfy public demand for "positive" action. Needless to say, this village did accomplish things—improvements in sanitation. The fly and mosquito population was reduced in a dramatic manner, and sanitary nuisances associated with sewage disposal were effectively reduced in number. But the progress of the poliomyelitis outbreak was not appreciably affected by these "positive" measures. One of the village officials, who was antagonistic and suspicious of the health department recommendations, became their ardent defender as a consequence of information received at Akron Children's Hospital, where his wife had to be taken—a victim of poliomyelitis. Proclamations issued by the mayors of the cities and towns had a very positive effect on the diffident attitude of many adolescents toward control measures.

Adversely affected by the extensive publicity given poliomyelitis in the newspapers and over radio and television stations were local resorts, recreational areas, and commercial establishments. One resort owner suffered a 70 percent loss in his summer's business as a result of cancellations. A groceryman was boycotted by his apprehensive customers and forced out of business when his son (and business partner) contracted the disease. Parents were reluctant to engage cottages or let their children attend camps. Plant managers and labor leaders were discouraged from holding picnics at a popular resort in Medina County by employees who feared the consequences of taking their families to large gatherings. Hundreds of telephone calls were received by the departments of public health from anxious parents and frightened individuals who became alarmed over newspaper headlines concerning the prevalence of poliomyelitis in this area. Scores of picnics were canceled, despite statements from the departments of public health that no great hazard existed. Persons living in the Cleveland and Akron areas wanted assurance that they would not contract poliomyelitis as a result of driving through the two counties.

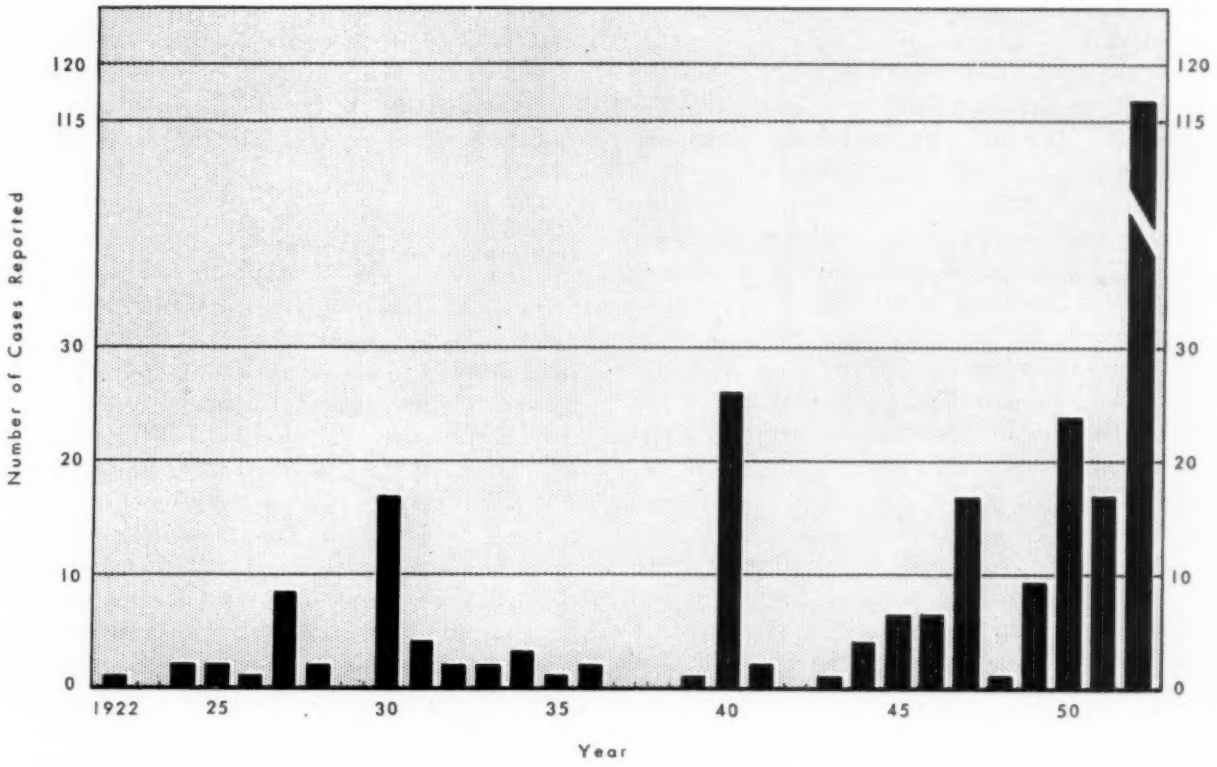
Combating Public Fears

Editors of local newspapers did a remarkably fine job of combating public fear and apprehension through common-sense editorials. Some of those which received wide comment were titled, "Keep Cool, Watch for Polio Symptoms," "The Common Sense Approach," "Don't Fear Polio, Avoid Panic Is Local Physicians

Poliomyelitis morbidity and mortality, Wayne and Medina Counties, 1942–52

Year	Medina County				Wayne County			
	Number cases reported	Case rate per 100,000 population	Number deaths recorded	Death rate per 100,000 population	Number cases reported	Case rate per 100,000 population	Number deaths recorded	Death rate per 100,000 population
1942	0	0	0	0	0	0	0	0
1943	2	5. 6	0	0	1	1. 88	0	0
1944	7	19. 4	0	0	8	14. 85	1	1. 85
1945	7	19. 0	0	0	6	10. 98	0	0
1946	4	10. 6	0	0	6	10. 82	0	0
1947	7	18. 0	0	0	17	30. 21	1	1. 77
1948	7	18. 0	0	0	1	1. 75	0	0
1949	10	25. 0	0	0	9	15. 54	0	0
1950	7	17. 0	0	0	24	40. 87	0	0
1951	4	9. 7	2	4. 75	17	28. 56	0	0
1952	117	280. 42	16	38. 34	117	193. 85	5	8. 20

Cases of poliomyelitis reported in Wayne County, Ohio, 1922–52.



Advice," "Precautions Urged When Polio Has Struck," and "Other Diseases Worse Than Polio." An especially fine editorial, which appeared in the July 11 issue of the *Seville Chronicle*, deserves mention:

Heard Any Good Rumors Lately?

Fear itself is a frightening thing. When you aren't sure what you fear, it becomes hysteria. When persons who really have no fear use the hysteria of others to avoid social and community obligations which have become bothersome, it is little short of criminal.

Yet we have seen children confined to their yards, and public gatherings canceled; we have seen local families shunned because of vicious and unfounded rumors—all because of a mass hysteria about polio. But, as this is being written on Monday, there has not been a single case of poliomyelitis reported in Seville, in Guilford Township, or in any child attending Seville school. Compare that with the rumors you may have heard!

Polio can strike here, but a fear-inspired quarantine which, taken to its natural and insane conclusions would last not just this summer but into the next, and the one after that, and abolish attendance at church and school, will not stop it. Give your child a normal, happy, healthy summer. Observe sensible health precautions . . . and punch anyone in the nose whom you hear spreading more rumors. You owe it to your children.

Finally, remember, the above advice is written, not by a disinterested observer, not by a misguided publicity seeker, but by the father of an only child, fortunate in that his work enables him to know his child during all her waking hours, vulnerable in his affection for her. And our little girl is going to lead a normal life, maybe learn to swim this summer.

The Medical Profession

When it became evident that poliomyelitis was getting off to an early start with the prospect of an epidemic by midsummer, conferences were held with the presidents of both county medical societies. On recommendation of the district health commissioner a special meeting was called on June 20 to which members of both medical societies were invited. Three prominent speakers outlined the clinical and epidemiological characteristics of the disease. A follow-up memorandum sent to all practicing physicians urged early reporting of cases; in addition, consultation was offered physicians with difficult cases. Questionnaires sent at intervals to practicing physicians

revealed that 72 percent have seen cases or suspected cases of poliomyelitis during the outbreak.

Local physicians in both counties voluntarily agreed to postpone tonsillectomies during the epidemic. The majority heeded the health department's admonition with reference to the inadvisability of immunizing children against diphtheria, whooping cough, and tetanus. With one possible exception, there have been no cases which could possibly be attributed to this procedure.

Several prominent physicians reported that they were literally "swamped" with apprehensive patients who were sure they were victims of poliomyelitis. There is good reason to believe that a large segment of the population under 15 years of age experienced symptoms which might very well be attributed to an abortive form of the disease. A few physicians observed physical findings which, from a clinical point of view, indicate the possibility of mixed infections. From an epidemiological standpoint, it appears that the outbreak in the southeast section of Wayne County was caused by a less virulent virus than that which attacked residents in the northwest section and which later spread to Medina County. The possibility of Coxsackie virus invasion of cases in the southwest section of Medina County seems plausible in view of clinical observations.

Special Studies

Mention has already been made of the invaluable help received from local chapters of the National Foundation for Infantile Paralysis. Another service rendered by that organization was the securing of a research team of experts from Yale University School of Medicine. Two staff members of the section of preventive medicine spent nearly a month in the two counties, obtaining blood and taking throat and fecal swabs of children who were close contacts of cases. This was done for the purpose of studying virus content and obtaining information as to the strain of virus involved.

Supplementing this aspect of the program were epidemiological studies by the staffs of each county department of public health, and an intensive series of studies by members of the Ohio Department of Health. The initiation of these studies, which are still in progress, had a tremendous impact on the populace in the affected areas. It apparently satisfied the desire of many people for "positive" measures to control the disease. In truth, it was all we had to offer.

Staff Problems

As the disease progressed and public anxiety mounted, a greater proportion of staff time had to be devoted to problems arising from the outbreak. Clerks had to be briefed concerning the answers to typical questions. The volume of telephone calls and visits to the office by information seekers rose to unprecedented numbers. A bulletin board recording the number of cases became the object of public attention as the totals continued to mount. Members of the nursing and sanitation staff were interrogated wherever they made their appearance. Unaware of the real source of the disease, many apprehensive and possibly vindictive householders made complaints with reference to insanitary conditions existing on their neighbor's property. The demand for testing of water samples rose nearly 30 percent.

Shortage of nurses and inability to obtain new staff members during the epidemic posed a serious threat to other public health activities. The maternal, infant, and child health programs had to be practically abandoned, and the tuberculosis clinic in one county had to be closed. The fear of contracting poliomyelitis among adults was practically as great as the fear of contracting tuberculosis, perhaps due in part to the extended publicity given cases and deaths of adults. The local chapters of the National Foundation for Infantile Paralysis tried in vain to recruit volunteers for a "polio lift" to assist parents and afflicted children who required transportation to a hospital for physiotherapy. Whether from fear of the disease or lack of time, it is a fact that few persons offered their services.

School Problems

Several weeks prior to the opening of the schools in September, a memorandum was is-

sued to all school administrators in both counties outlining a course of action with respect to the opening and conduct of the schools in the presence of an outbreak of poliomyelitis. Principles laid down were in accordance with the recommendations of the Ohio Poliomyelitis Advisory Committee and the National Conference on Recommended Practices for the Control of Poliomyelitis held in Ann Arbor, Mich., in June 1949. These bodies, it will be recalled, recommended that schools be opened at the usual time and that they remain open during the course of an epidemic. To justify delaying the opening of schools in those areas where the disease was still rampant, authority was secured from the boards of health in the counties to declare school districts critical areas. Only four school districts, however, were so designated.

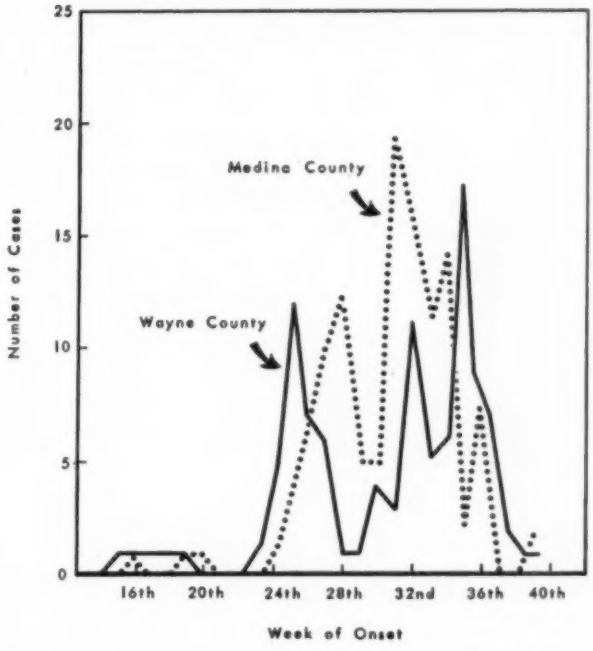
But, despite the announced policy of the boards of health to favor opening of schools on September 3 except in these four areas, public opinion, as expressed by parent-teacher associations and apprehensive alarmists, succeeded in forcing boards of education to delay the opening of all schools in both counties for 2 weeks. Although it is too early to ascertain whether the course of events will justify the stand taken by the boards of health, it is plain that public opinion overwhelmingly favored a delay in the opening of the schools. The public is not quite ready, it seems, to accept the advice of health authorities on this point largely because of our repeated admonition to parents that their children "avoid crowds" and "unnecessary contact with persons other than their usual associates."

Camps, Carnivals, and Fairs

With few exceptions, boys' and girls' camps were avoided by parents of children in both counties. Standard advice by the Ohio Department of Health to parents and camp directors concerning the desirabiliy of keeping camps open had little effect on anxious parents who visualized each child with poliomyelitis as a permanent cripple.

Several prominent organizations had to cancel contracts with carnivals for summer appearances largely because of public pressure.

Poliomyelitis cases by week of onset, Wayne and Medina Counties, Ohio, 1952.



So great was the fear of poliomyelitis that the county fair boards of both counties decided against holding a fair. It was the first time in 103 years that a fair had not been held in Medina County.

Hospitalization and Rehabilitation

Although provision of hospital facilities for the care of poliomyelitis cases does not ordinarily fall in the category of public health administration, it is of utmost importance that public health organizations and hospitals work together in ameliorating the problem. Since the treatment of poliomyelitis is a specialized task requiring the services of different types of medical specialists and special equipment, only well-equipped hospitals can meet such emergencies. Fortunately for residents of Wayne and Medina Counties, the Akron Children's Hospital accommodated all patients sent there by local physicians.

As patients were discharged from the hospital, it became apparent that a serious deficiency existed in the over-all program. Parents were failing to return afflicted children to the hospital for physiotherapy. In Wayne County this situation had been anticipated, and, with

the help of funds from the National Foundation for Infantile Paralysis, it was possible to increase the time of a physiotherapist in the county sufficiently to cope with the increased demand for her services. At a joint meeting held at the Akron Children's Hospital September 5, it was agreed to set up treatment centers in Wayne, Medina, and adjacent counties where patients discharged from the hospital could receive the treatment indicated by the Akron physician in charge of the case. Once a month after release the child is to be returned to the hospital for a review of his case. This plan of decentralization is being tried; it remains to be seen whether parents will cooperate any better now that the travel involved has been effectively reduced.

Aggressive Educational Program

Every health department confronted with an epidemic of poliomyelitis finds itself the object of criticism by well-meaning but ill-advised "experts." Public opinion as expressed by these individuals can be damaging. In our opinion the best defense against such individuals and the half-truths which they occasionally succeed in getting before the public is an aggressive educational program. While it is plainly evident that our best efforts at informing the public concerning desirable procedures did not always succeed, we are convinced that, had we not done so, the results might have been still more hazardous.

It has been aptly said that every poliomyelitis epidemic comprises actually two diseases, poliomyelitis and hysteria. It takes a strong personality to tell the public, in the face of increasing numbers of cases, that medical science has not yet devised an effective control program, and the capacity of a field general to face a room full of hysterical parents and tell them to lead a normal existence during the progress of an epidemic.

With a few possible exceptions, the public has cooperated unusually well with the public health officials. Village and city officials have also given excellent cooperation. Despite the fact that a county-wide quarantine was invoked in a neighboring county, the boards of health in Wayne and Medina Counties have shown no inclination to do likewise. Instead, they have supported the contention of the health officer that responsibility for the spread of the disease rests primarily on the shoulders of parents. Child contacts have, however, been uniformly quarantined by health department officials for a period of 7 days from the last exposure.

Of considerable interest in this particular outbreak has been the extent to which the people have subscribed to poliomyelitis and hospitalization insurance. Approximately 50 percent of all hospital admissions in both counties were covered by poliomyelitis insurance; approximately 15 percent had hospitalization insurance. By virtue of this situation, the burden of the National Foundation for Infantile Paralysis was appreciably lessened.

Conclusion

The modern department of public health has a very real job to perform in meeting the problems of a poliomyelitis epidemic. Through the medium of community organization, it can alert the public to the nature of the disease and the available means for combating it. Public health workers must be prepared to assume the initiative in formulating a community-wide program; they must also be prepared to accept the responsibilities and the criticisms that go with the establishment of the program. Finally, it should be emphasized that control of poliomyelitis, including treatment and rehabilitation, is a cooperative enterprise, involving a host of agencies, all of which are essential in a successful program.

Ideas

Maplewood Dental Plan

MAPLEWOOD, N. J. How to handle a small number of dentally indigent school children without the overhead of a full-scale dental clinic is the problem.

Solution. The school medical department refers all cases of suspected or alleged dental indigency to the public health nurse who investigates the family's eligibility for dental care according to a family income scale approved by the New Jersey Dental Society. Children of eligible families are then referred to any one of the 16 local dentists of their choice, all of whom participate in the plan. The dentist, after inspection, estimates the work needed and its cost at a stipulated hourly rate. Upon approval of the estimate by the health officer, the dental work is completed, and the dentist is paid from funds provided by the Maplewood Service League, a women's civic organization.

Advantages. The plan's cost is a small percentage of the cost of maintaining clinic facilities. The plan eliminates any stigma of indigency which may be attached by some to clinic attendance. It encourages the children to continue going to the dentist of choice when their parents can again afford the service. It encourages parents who plead inability to pay, but who are ineligible under the plan, to provide overdue dental care at their own expense.

The plan was developed by the Maplewood Health Department, the board of education, and the local dental society.

Small Mobile Unit

MISSISSIPPI. A mobile unit has been designed, weighing 7 tons instead of the original 11 tons, to reach remote areas in the State for chest X-ray surveys when bridges on second- and third-class roads will not carry the weight of the larger mobile chest X-ray unit.

The Mississippi State Board of Health purchased a 2-ton truck chassis with cab and had the body constructed to meet essential requirements for its X-ray equipment. The truck with the body complete, as shown in the picture, cost approximately $4,000, and is considerably more economical to operate and maintain than the older and larger mobile unit.

The inside measurements are: width, 7 feet, 1 inch; length, 13 feet; height, 6 feet, 4 inches. Doors for entrance and exit are both on the right side (as in the larger unit) and are 26 inches wide. There are two built-in steps and one removable step for each door. The body has an inside lining of half-inch plywood. The floor has a plastic covering which carries a 15-year guarantee, does not require waxing, and is not sensitive to oil.

The equipment is arranged to provide a suitable desk for the clerk near the entrance at the rear of the bus and ample room for the technician to perform his duties.

Union's Health Circuit

PENNSYLVANIA. The mobile health survey program of the International Ladies' Garment Workers' Union brings the services of a permanent health center to outlying shop units.

The service was developed over the past 5 years by Dr. James Bloom, medical director of the union's health and welfare department for central and western Pennsylvania. It is a variation of the multiple health screening technique.

A team of two medical technicians, carefully trained in the taking of medical histories, make the rounds of scattered units of the union's constituency. One is a medical case worker, and the other is a clinical laboratory technician. Together, they interview and test 10 to 12 workers daily. Union members are interviewed at their factories in private rooms set aside for the purpose. No physical examination is given, however.

Laboratory tests include: blood pressure, pulse rate, urinalysis, complete blood count, and additional determinations of sedimentation rate or blood sugar, if advisable. Visual adequacy is determined by a telebinocular apparatus.

Histories and laboratory reports are evaluated by the medical director, who reports significant findings to the worker's family physician. Reported participation is good—from 68 to 81 percent of workers in 89 shops. At the completion of two circuits, more than 13,000 patients had been seen, 5,338 significant abnormalities revealed, and 762 physicians contacted.

The program, with its emphasis on skillful interviewing for medical history, supported by laboratory values, has placed a large number of persons with previously unrecognized disease under medical care and, at the same time, has conserved medical manpower.

Sanitation Self-Rater

SAN DIEGO, CALIF. Owners and managers of eating and drinking establishments can determine whether they are providing their employees with essential guidance and materials.

A self-rating form has been devised by the local public health department to give conscientious supervisory personnel an opportunity to check themselves on their own attitudes, policies, and sanitation practices.

Not an inspection form and not for rating the performance of other personnel, the self-rater is intended solely for the supervisor. It covers the training of personnel, provision of adequate materials and suitable equipment, delegation of authority, provision of wholesome food, adequate utensil sanitization, and effective vermin and rodent control.

Looking Ahead of 1952

By PAUL Q. PETERSON, M.D.

Every health officer has two broad areas of responsibility. The first is primarily medical in nature and requires the diagnosis and treatment of the medical ills of the health officer's patient—that patient being the total community of people residing in the health district which the health department serves. The second responsibility is primarily administrative and requires the ability to organize and supervise personnel and facilities necessary to achieve the integrated health program which is planned for the health district.

In the practice of medicine an error in diagnosis and therapy by the physician jeopardizes the health and welfare of the individual patient. The health officer's mistake in diagnosis and therapy may jeopardize the health of hundreds of individuals and the welfare of an entire community. Therefore, from the standpoint of our first responsibility, we in public health must attempt to foresee the future public health needs of our patient and prepare programs that anticipate the changing disease problems facing our health district.

In the area of administration, the business executive who makes mistakes measures his failure in terms of reduced earnings. The public health officer's mistakes in the administrative field are measured in sickness. Therefore, the health officer must at regular intervals take stock of the abilities and efforts of the individuals engaged in the various programs. He should also attempt to anticipate changing social and economic problems.

Dr. Peterson, assistant director of health of the Ohio Department of Health, presented this paper before a meeting of the Ohio Public Health Association at Columbus, May 28.

This entire process represents what we in public health term as evaluation of the programs of our departments. For the most part the information, knowledge, and ability to achieve this objective rests within the hands of the local health officer. However, because of the complex nature of disease and of our social order, the local health administrator must draw upon sources of information which are broader than those available within his health district.

There are some significant trends which the Ohio Department of Health believes will create an impact on local health problems and therefore should be taken into consideration by the local health commissioners in planning services and programs for the protection of the public health in the years to follow.

Civil Defense

Probably no public health program has presented greater problems than civil defense. It is a situation in which none of us is really intimately familiar with the extent of the problems we will face. Although we have a broad background of experience in many of the areas, we are not completely sure of how the entire program should be developed to the best advantage. Also, we are faced with a public reaction which has been particularly frustrating. The attitude of many citizens ranges from complete indifference to hysteria, depending upon newspaper headlines and announcements which come from Washington. Because of indecision, there is also a state of confusion which has made it practically impossible to plan intelligently.

We feel, however, that the picture is clear enough at present for concrete action by community leaders who have true ability and honest

interest. State planning appears to be on a sounder basis, and for the first time real progress may be anticipated. This now places on the local health departments and health commissioners the responsibility of putting the program into effect.

Two important facets in the planning stage are of particular interest. The first is a plan for taking care of casualties that might be expected should an attack occur on one of the target areas in the State. This plan will specify what each community will be expected to do. It will make possible specific planning in the local community for a particular program without needless concern for problems which probably will not come to that locality. As this program is developed each local health department will be kept informed and the State department will depend upon it to provide this service.

The second program being completed is that of medical stockpiling of supplies and equipment. Ohio has participated with the Federal Civil Defense Administration in purchasing supplies which might be needed and has sent lists of those items to each health commissioner. The items are now being received and will be stored in strategic locations.

Drugs which require professional supervision will be located in hospitals surrounding the target areas and will be available for transportation to areas of need. Items which require only normal storage will be strategically located in the State, available for ready transportation to communities needing help. We recognize that there is an insufficient quantity of such equipment to satisfy the complete needs of the State. However, when it is remembered that this equipment will supplement supplies purchased by the local communities of Ohio and that local and State supplies will be complemented by Federal equipment, we may feel more secure that these essential items will be available when needed.

We would therefore alert the health commissioners of Ohio to the fact that the ensuing year will require of them a greater interest in problems of civil defense and that their medical administrative ability will be sorely needed if this program is to be successful.

Financing

The period of Federal support for basic local health and State health programs is ending. Within the past two fiscal years the total grants-in-aid allotted to Ohio for public health has been reduced by nearly one-half million dollars.

Fiscal year	*Grants-in-aid*
1950	$1,951,883
1951	1,944,361
1952	1,842,002
1953	1,561,324

This reduction has created serious fiscal problems for both the State and local health departments. However, it may represent a blessing in disguise. Without a sound method of financial support which comes primarily from State and local sources, it is impossible to build the type of public health service in this State which can develop according to its particular needs and have sufficient financial stability to encourage long-range planning.

Added to this reduction of income, local departments are faced by mounting costs of service and the necessity of competing for their share of the tax dollar. Under a difficult tax structure, which cannot possibly provide funds necessary for all local governmental operation, it becomes absolutely essential that public health administrators devise a more stable financial structure for public health and the most efficient basic organization that can be recommended to the citizens of the State to insure the greatest return in service for the tax dollar provided to the health department.

Personnel

Because of the expanding horizons of public health and scientific research, which are giving us new methods and greater knowledge, the public health worker must have high standards of professional qualifications. No longer is our service primarily a police action. It is founded upon an educational approach for the application of scientific principles which will reduce the health hazards of the communities we serve.

The inclusion of a wider range of scientific disciplines and individuals of varying abilities requires the health commissioner to engage in

more serious planning so that the varying abilities of staff members may be integrated to best advantage. Constant in-service staff training should be established, for unless the health commissioner makes available to his staff new knowledge and techniques the programs will certainly suffer.

A second major problem in this area of personnel is that of shortages. We are all painfully aware of this problem because of our inability to fill many positions which have been budgeted. From studies made in Ohio and the country as a whole, we may anticipate continued shortages in qualified medical, nursing, and sanitation personnel. It is therefore necessary that we use the qualified talent at our disposal to best advantage and seek out ancillary personnel who may be useful.

Programs

We have heard much in the past about new programs. Especially, we have been urged to develop programs in the chronic disease field. These requests are proper because a larger population group is living in the age span in which these diseases take their toll. Community resources need to be marshaled and applied to these problems.

My main concern has been that too often we hear the statement, "The acute communicable diseases are now whipped. Public health must look for new fields to conquer." Nothing could be further from the truth. We may state flatly that we are not doing as well as we can with our present knowledge. There is an absolute necessity for better application of existing programs which have proved of value. Diseases for which immunization and other protective measures are available may, by judicious application of these procedures, be eradicated. We should not be satisfied with a decrease in their incidence and prevalence but should continue to apply with ever-increasing effort our control procedures with the aim of complete eradication of these maladies.

It must also be remembered that when we create artificial controls, usual host parasite relationships are altered so that we must maintain constant vigilance and control efforts. Should we fail, we will have created a population susceptible to unprecedented rises in both incidence and prevalence. Diseases which fall in this category are: smallpox, typhoid, diphtheria, whooping cough, venereal disease, tetanus, and tuberculosis.

Another need in communicable disease control is for additional exploration in two areas:

1. We should investigate new control procedures for diseases about which we have amassed considerable knowledge but which are obviously not responding to present methods. For example, it may be that in brucellosis the emphasis on economic rather than on public health needs for control has been misplaced. Or in rabies our concern with the animal reservoir rather than the epidemiology of the disease in animals may be misdirected. Or in poliomyelitis our interest in the patient rather than the reservoir of infection may be a fallacy.

2. We must investigate public health hazards presented by diseases where these problems have not been clearly delineated in the past. For example, a recent epidemic of psittacosis among workers in poultry processing was traced to turkeys, a heretofore unknown reservoir of infection. Recent work has already shown that such diseases as histoplasmosis, toxoplasmosis, leptospirosis, and amebiasis may present dangers to public health which have not yet been appreciated and against which no adequate control programs have been formulated. Continued investigative effort and an open mind for the acceptance of new information and procedures by those actually administering programs is an essential need.

Two concurrent movements are making it necessary for the health commissioners of Ohio to enlarge their horizons:

1. It is apparent that Ohio is experiencing a ground swell of public interest in public health. More people on the street are becoming interested in public health programs and are willing to offer more support than ever before in the history of our commonwealth.

2. Public health as a field of official service is receiving ever-growing responsibilities. New programs are constantly being requested, and the talent of the health department is being

recognized because more and more legislative bodies are planning these programs under the administration of public health departments.

Thus, it is becoming evident that we may not permit our thinking to be stultified nor our programs to be stereotyped. We must adopt the philosophy that we are responsible for the total health needs of our communities and must be constantly planning to use the facilities within our districts in order that these community health problems may be brought under control.

I say quite sincerely that the local health departments hold the key to success of public health in Ohio. Either we are progressive, energetic, and intelligent enough to meet our problems in a scientific and efficient manner completely divorced from personal considerations or public health will fail to retain public respect.

The interest of the public and their desire for service is unquestionable. If we have vision, dedication to service, and the courage to move ahead, our profession will prosper and our rewards will be many. If, on the other hand, we fail to accept this challenge because of lack of vision, personal interest, or a lack of courage, then we may be assured that ahead of 1952 lies a dismal prospect with diminishing public respect, limited budgets, and ever-decreasing responsibilities.

Court Rules Against Hoxsey Clinic

The United States Court of Appeals for the Fifth Circuit, sitting at New Orleans, on July 31, 1952, ordered the district court to enjoin Harry M. Hoxsey and the Hoxsey Cancer Clinic of Dallas, Tex., from shipping from the State their two colored liquids intended for use in the treatment of cancer. This reverses the decision of the District Court of the United States, Northern District, Dallas Division (Dec. 21, 1950), which refused to grant an injunction.

After reviewing the testimony of 50 physicians and pathologists and 5 nationally known cancer specialists who had testified for the Government and about 25 defense witnesses, the appeals court in a unanimous opinion found that the conclusions of the lower court were not supported by the evidence and that these Hoxsey "remedies" do not cure cancer. The court made these two pertinent rulings:

". . . when the subject of investigation is the existence of cancer, the personal testimony of the lay sufferer is entitled to no weight, since the overwhelming preponderance of qualified opinion recognizes that not even the experts can assuredly diagnose this condition without the aid of biopsy and pathological examination."

". . . despite the vast and continuous research which has been conducted into the cause of, and possible cures for, cancer the aggregate of medical experience and qualified experts recognize in the treatment of internal cancer only the methods of surgery, X-ray, radium, and some of the radioactive by-products of atomic bomb production."

The drugs in question originated about 1840, it was testified. One contained a laxative and potassium iodide and extracts of prickly ash, red clover blossom, and alfalfa; the other was chiefly of lactated pepsin, a flavoring used to disguise the unpleasant taste of potassium.

Psychiatry in Medical Education

The concentration of medicine during the past 75 years on the conquest of infectious diseases, on the science of bacteriology, and on the contributions of physics and chemistry to biology has tended toward a medical view of man as an isolated biological unit.

A somewhat similar isolationism accompanied the recent accelerated growth of psychiatric knowledge. In the efforts to establish diagnostic techniques, there was a tendency to equate the patient with the symptoms and patterns of behavior accompanying his illness. Concentration on the work of defining, limiting, and clarifying meant that, for a time, psychiatry, too, developed as a compartmentalized medical discipline and lost sight of the simple fact that the patient is a unique human being, a person subject to a variety of physical and emotional ills.

Following the tradition of Adolph Meyer and William Alanson White, forward-looking psychiatrists have long been pointing to the need to return to the main stream of medicine and reintegrate knowledge about psychic and somatic factors. They recognize that few patients fit into the classical clinical patterns of mental illness and that, to treat the patient, all factors affecting the personality of the individual must be considered. In this, physical complaints are as important as emotional factors.

Dissatisfaction with the fragmented view of the patient has grown with the realization that, to be effective, medical treatment must do more than concentrate on the disease entity. The whole person must be treated. Consideration must be given to factors of personality and behavior which influence and are influenced by physiological condition; consideration must also be given to the environment of the person under treatment. The effect of interpersonal relations and cultural forces on the individual must not be overlooked.

The medical profession is, in a sense, "rediscovering" what historically has always been the goal of medicine—to treat the person as well as the disease. Psychiatry, as a branch of medicine, is serving as the catalyst in bringing about the changes required by this "rediscovery," for "nothing that is human is foreign to psychiatry." Its particular focus gives psychiatry a strategic role in the movement of medicine toward dealing with the patient as a person.

The Practicing Physician

The conference reemphasized the social responsibilities of the physician. It was agreed that the community has a right to expect the physician to perform his functions with an understanding of the individual patient's emotional and social problems—that the community has a right to expect preventive medicine.

The physician has obligations to his patient's family and his patient's environment as well as to his patient. Problems related to child growth, the aged, chronic illness, and problems related to the supply of physicians require thought and action by both the community and the profession of medicine. The physician must be aware of the contributions of professions other than that of medicine. He must work with members of those professions if his own contributions are to be most effective.

A major purpose of psychiatric teaching is to prepare the physician for his most effective contribution to the community by providing a cross-fertilization between medical science and social science with emphasis on the importance of understanding people as human beings. The concept of the physician and the patient as total persons in a total environment involves a humanistic even more than a medical approach.

The growing trend in modern medicine toward a reemphasis of the need to treat the patient as a whole person was pointed up sharply in the Conference on Psychiatric Education held at Cornell University, Ithaca, N. Y., in June 1951.

Organized and conducted by the American Psychiatric Association and the Association of American Medical Colleges under a grant from the National Institute of Mental Health of the Public Health Service, the conference formally stated its purpose as the promotion and preservation of the health of the community "by investigating, defining, and helping to develop programs which will improve the teaching of basic and clinical psychiatry; by advancing the medical skills needed to recognize and treat mental illness and emotional maladjustment; by coordinating the efforts of all groups concerned with these problems so that their total resources may be used most effectively."

The recurrent theme throughout the conference, as contained in its report published in June 1952 by the American Psychiatric Association under the title of "Psychiatry and Medical Education," was the role of psychiatry in the development of integrated medical teaching. The main lines of discussion, with emphasis on public health implications, are summarized here on the basis of the published report.

Dr. Seymour D. Vestermark, author of the summary, is chief of the training and standards branch of the National Institute of Mental Health and was a participant in the conference.

Integrated Medical Education

It was suggested in conference discussions that psychiatry could lead in coordinating medical teaching in some areas. One area is that of the physician-patient relationship, basic to all of medicine. The department of psychiatry should be responsible for this teaching area because of its special insight into the dynamics of interpersonal relations. But special attention would need to be given to integrating the department of psychiatry with the other departments in the medical center.

Similarly, another area in which psychiatry can be helpful—interviewing and history taking—presents problems which stress the need for integrated administration and cross-fertilization among the different departments of the medical school. Case histories written by psychiatric residents tend to lack critical medical information, whereas case histories written by medical residents tend to bypass emotional attitudes and unconscious factors. It was suggested that the kind of interdisciplinary program needed to teach interviewing and history taking should be supported and developed by frequent communication among faculty members and between students and faculty.

Research Opportunities

For psychiatry, one of the broader implications of a rounded medical education is the continuing need and opportunity for research to validate the empirical body of knowledge acquired through clinical practice. The conference recognized the value, for medical instruction in psychiatry, of the body of knowledge derived from intensive treatment of patients whose symptoms are classifiable. But to prevent teaching from becoming mere indoctrination, it is essential that clinical knowledge be supplemented by related research, such as animal studies, investigations into the physiological and biochemical components of emotional health and emotional disturbances, and controlled experiments on the role of the learning process in psychotherapy.

On the other hand, the emphasis of psychiatry on the social aspects of medicine has far-reaching implications for a redirected program of medical training. Current thinking that emotional maladjustment has its roots and first manifests itself in early childhood points to the need for integrating the study of pediatrics and psychiatry, and for including the subject of growth and development in undergraduate medical instruction in psychiatry. Many medical schools are experimenting with courses in growth and development taught jointly by the departments of pediatrics and psychiatry. This is but one example of how the complex nature of social influences on physical health and disease might better be taken into account.

Psychiatry thus opens the door for contributions from the social sciences.

Human Ecology and Human Personality

A significant portion of the conference was devoted to discussing the need for including study of human ecology and human personality in the medical curriculum. Predicated on the assumption that to fully understand an organism it is essential to understand the organism's environment, the study of human ecology would include material from social anthropology, psychology, and sociology. This material, together with material drawn directly from the field of psychiatry on human personality and on human ecology, would complement the study of human biology in the medical training program.

In listing some of the more important components of the study of human ecology and personality, the report of the conference groups topics under four major headings. Those areas of personality closely related to the study of physiology include perception, learning, emotion and motivation, and language and thought. The study of normal child behavior, and of adolescence, maturity, and senescence constitute the segment of human ecology concerned with the genesis and decline of complex human activities. The third grouping—the nature and development of personality, and the study of individual differences—is followed by a fourth grouping devoted to society and culture—the family, the interaction of personality and culture, and the forces contributing to social organization and disorganization.

Coordination

The task of incorporating such broad areas of knowledge into the medical curriculum presents some major problems. While instruction must be focused on the primary goal of producing adequately prepared physicians, it must also be designed to fit all the related parts of medicine into a coordinated presentation. A special group will need to be organized whose function it will be to insure effective teaching of human ecology and personality. This means adding to the faculty physicians with training in the social sciences and social scientists who have had experience in a clinical setting. Together, these teams might be able to cooperate on research projects and join forces in coordinating medical teaching.

The conference report indicates that currently there is a growing tendency toward integrative teaching in medical centers—sometimes involving cooperation with departments in other schools of the university. Most schools also are attempting to include instruction in psychiatry in all 4 years of the medical curriculum. Since psychiatry is linked with the practice of medicine generally and, in particular, with such areas of medical practice as pediatrics, internal medicine, endocrinology, and neurology, and since it must take into account social, cultural, and environmental considerations, it can serve as an excellent means of integrating the fragmented approach of medicine and of bringing medicine closer to the social sciences and related disciplines.

In considering techniques that might be used for integrating instruction, the conference placed much emphasis on methods which fit into the framework of a patient-oriented approach to medicine. Such methods include clinical clerkships, around which all clinical teaching in undergraduate medical school is developed, and the newer method of preceptorships in which students work directly with physicians in general practice. Also, the assignment of students as family medical advisers will enable them to see patients in their natural habitat and to gain first-hand knowledge about the chronic illnesses and the social aspects of illness.

The Future Physician

Consideration of the patient-oriented approach to medicine raises questions which prompt a reevaluation of the physician's role in society and of the kind of person the physician might ideally be. In addition to his specialized responsibilities, the physician has an opportunity to function as a leader and should be sensitive to the issues and problems of his community and to the people in it. The medical school recognizing this is paying increasing attention to the development of the medical stu-

dent both as a mature individual and as a well-qualified member of the medical profession.

In any list of the assets which the future physician should bring with him to medical school, the factors indicating success in interpersonal relationships are of extreme importance. Some critics question whether current admissions policies result in the selection of students who are potentially most capable of fulfilling the responsibilities of socially oriented physicians as well as of scientists.

The conference, in addition to pointing out the loss of good students through restrictive admissions policies and artificial quota systems, strongly urged the need for a shift in emphasis in selection criteria. The current emphasis on scholastic grades places too great a premium on preparation in the basic sciences, on interest in things rather than in people, without sufficient regard for the personal and social aspects of medicine.

It was suggested that a psychiatrist be included on the admissions committee of a medical school to help in the interviewing and the selection of students. It was also suggested that the medical school faculty confer frequently with the advisers of premedical school students to interpret to them the need of the future physician for broader areas of knowledge and understanding.

The emphasis on the medical student as a well-rounded individual with a liberal college education, an individual aware of his responsibilities to society and sensitive to the pressures and problems of his fellow citizens, carried over into the conference discussions about the general nature of medical education. Personality growth, stimulation of thought and action on the part of students, and close faculty-student relationships were stressed as primary goals of medical education.

Creative Teaching

The trend away from didactic instruction and toward freedom for the student to express doubt and criticism is further complicated by the increasing difficulty of imparting the full fund of current medical knowledge in a 4-year course of study. The almost overwhelming amount of knowledge the medical student must now acquire intensifies the natural anxiety he experiences as he begins to realize the responsibilities he is assuming as a future physician. The aim of medical training, therefore, must be to develop insight into the principles, and skill in the application, of working methods.

Medical school teaching provides the opportunity for a creative kind of teaching. In building the medical faculty, more consideration should be given to teaching ability as well as to research and clinical interests. To provide the student with a milieu in which he can develop his interests, acquire knowledge in a coordinated fashion, and at the same time gain experience in dealing with human beings, the individual faculty members, the various departments, and the administration of the medical school must pool their resources—philosophical, scientific, and professional—as well as those of personnel, equipment, and space.

Solution

In conclusion, the conference report emphasized that "the techniques of teamwork and group action extend beyond cooperative work with physicians. Many of the problems cited . . . cannot be solved by caring for the individual patient or family but must be approached on a community-wide basis. The physician's work must more and more be integrated with the broad program of preventive medicine and maintenance of health. This is so because the skill and knowledge required for the mastery of major problems of 'social engineering' exceed the resources of the individual physician. Knowing his limitations, he must be able to assess the resources of other groups and to join in teamwork for community betterment, contributing his special skills and knowledge about stress and illness, and recognizing the contributions of other disciplines."

In the light of what psychiatry has already learned about how people function and how psychic, somatic, and social factors are inextricably interrelated, the integrative force of psychiatry and medical education should be a force for better mental and physical health.

—Seymour D. Vestermark, M.D.

Psychology, Mental Health, and Aging

Highlights of the papers presented during the fifth Annual Scientific Meeting of the Gerontological Society in combined session with the division of maturity and old age of the American Psychological Association are given here. The conference was held in Washington, D. C., September 5–7, 1952.

PHR **Conference Report**

Need New Intelligence Criteria During Maturity

Intelligence does not decline with early maturity, according to Raymond J. Corsini, M.S., Wisconsin Department of Public Welfare. This is in contradiction to the classic findings of Wechsler, who maintains that every human capacity after attaining a maximum begins an immediate decline.

Mr. Corsini reported on studies made on 1,072 inmates of San Quentin prison. Ten of the subtests of the Wechsler-Bellevue Adult Intelligence Test were given to the group, which included 172 men past the age of 60. This is the largest number of older people studied on an individual test. In comparing his findings with those of Wechsler, Mr. Corsini noted that for both groups performance ratings drop off, but with respect to verbal abilities the combined trend for the San Quentin data is to rise from 15 to 55 and to fall from that point on, while Wechsler's verbal average holds fairly well to about the age of 40 and then falls. From Wechsler's data it appears that there is little difference in the amount of general cultural knowledge of people 15 and 55. From his data Mr. Corsini reported that the 55-year-old people appear to have more cultural knowledge.

Must Define Intelligence

Among his conclusions, Mr. Corsini noted that when age is a factor in the correlation of each subtest with the whole test, the tests measure other things besides intelligence, such as visual and auditory acuity and motor speed. He said further that we cannot discuss intelligence and aging unless we know what is meant by both terms. He suggested that a distinction be made between intelligence as a "within-the-skin concept of mental ability" and "intelligent behavior."

Mr. Corsini questioned the wisdom of measuring intelligence by items variously affected by age. The single best item in terms of measuring intelligence which is least affected one way or another by age appears to be immediate memory as measured by the digit span test, he said.

In the discussion which followed the presentation of this paper, Dr. David Wechsler, psychologist of the Bellevue Psychiatric Hospital, and "father" of the Wechsler-Bellevue Intelligence Tests, said that new criteria are probably needed in order to assess factors governing intelligence. It is probable, he said, that different kinds of tests should be applied at each 5-year age level since the same kind of tests could not measure the intelligence of an infant as well as that of an older person.

Rorschach Test Taps Personality Facets

"Although the usefulness of the Rorschach in a clinical setting has been well established, the validity of the technique is not so unequivocal as to be taken for granted by the experimental clinician," stated Charles Wenar, Ph.D., of the Institute of Psychosomatic and Psychiatric Research of the Michael Reese Hospital, Chicago. This is especially true when it is used on populations which previously have received relatively little attention, such as aging individuals.

Dr. Wenar reported on studies of 20 subjects between the ages of 55 and 65, all members of a class titled "Making the Most of Maturity." Psychological and psychiatric examinations were given and the members' social adjustment was recorded

by a trained observer in the class. Good Rorschachs were defined as those which revealed emotional richness and stable control. Two types of deviations from health were an overemphasis on emotion, and an overemphasis on control.

Need Behavioral Observations

Dr. Wenar found a high, positive correlation between Rorschach and psychiatric ratings and a low, positive correlation between Rorschach and social ratings, and between psychiatric and social adjustment ratings. He interpreted this as meaning that the Rorschach can be used as a valid measure of the general intactness of the personality structure of the aging individual, but it is of only limited usefulness as an index of the constructiveness of the individual's behavior in a social situation.

The Rorschach, like a psychiatric interview, can tap many important facets of the personality, but it would be naive to think that it can cover the entire behavioral repertoire of the individual. A further implication, Dr. Wenar said, is that in order to get as full a picture of the person as possible, such abstract or "depth" techniques should be supplemented by behavioral observations in real life situations.

Elderly Often Wrongly Thought Psychotic

Many elderly people who are thought to be mental patients are placed in a mental hospital when their condition may be due to extreme excitement and confusion, nutritional deficiencies, overmedication, alcoholic intoxication, or emotional hysteria, reported A. J. Tutles, M.D., of the Hillside Home and Hospital, Bridgeport, Conn. He found in a study of cases sent in for commitment to a State mental institution only 20 percent were truly psychotic.

At the Hillside Home there is a detention unit in which these patients were observed 3 days or more. Of 93 cases, only 18 were committed to the mental institution. In 75 cases, the diagnosis was in error.

With proper evaluation, classification, rehabilitation, and placement of the chronically ill, infirm, and the aged, further mental and physical deterioration can be prevented and some of the overcrowding of mental institutions will be alleviated, Dr. Tutles said.

Oldsters in Homes Have Few Complaints

Contrary to normal expectations, men and women living in institutions have fewer complaints about their physical and mental health than those living in their own homes, according to Dr. Jacob Tuckman, Ph.D., Columbia University. However, women in institutions have more complaints than men. This may be due not to actual differences in mental and physical health in the men, but because institutional care tends to minimize their complaints. The women apparently do not react in the same way to institutional care and, therefore, have as many complaints about their health as their sisters living at home.

The decrease in physical and mental complaints among the older age groups is contrary to expectations because with age there should be an increase in susceptibility to disease. The findings suggest that symptoms may disappear with age because the threshold of pain may be higher or that older individuals accept more readily the cultural stereotype that poor health is a concomitant of aging, Dr. Tuckman felt.

In another study, Miss Vilma Olsvary, B.A., of the Mental Health Institute, Cherokee, Iowa, found that the residents of county homes in Iowa are a depressed, forlorn, and hopeless lot. These people are in the homes because of physical or mental illness, or because they have no family to take care of them, but, mostly, because they have little or no money and have been ousted from their community. Seventy elderly residents of four of the county homes were surveyed. These included 47 persons classified as normal and 23 as slightly below normal. The factual psychological picture reported by Miss Olsvary is that these elderly people in the county homes are living in an inner and outward atmosphere of depression, loneliness, resignation, and social isolation.

These forlorn people resent being in the home and wish they were out, but few have plans for the future. In general they have a negative attitude toward themselves. The majority feel that the years under 40 were the most profitable and the happiest and the years since 40 the least happy, and that they can expect nothing of themselves or of society in their years to come.

Some environmental conditions have their influence on these psychological reactions, said Miss Olsvary. She did not discuss the question of whether the county home is the best solution for all these people.

Factors Influencing Behavior in Elderly

In spite of the effort and time required, it is important to attempt to recognize both the conscious and unconscious influences affecting behavior in elderly people, said Ewald W. Busse, M.D., division of psychosomatic medicine, University of Colorado Medical Center. Using a group of patients from the outpatient department of the Colorado Medical Center and a hospitalized group of patients from the wards of the Colorado Psychopathic Hospital, Dr. Busse and his colleagues inspected three major aspects of their lives: religious activity and feelings, sexual activity and feelings, and re-

lationships with their children. He found that there is a definite shift of activity in religion. There is less participation in church and church functions although there is no change in belief in a deity. They felt that church attendance was not necessary, he found, since they are involved in little or no guilt producing behavior.

In the two groups interest in sex was not lost. Among women more than among men, sexual frustration is a very important anxiety producing factor in the aged.

The attitude and behavior of older persons in regard to their grown children, according to Dr. Busse, is largely unconsciously determined and represents the end product of a life-long series of events—largely influenced by dependency-hostility conflicts. A definite correlation between parental attitudes existing many years ago and the type of reaction now apparent between the grown child and the subject was found in the study.

Perceptual Clarity and Aging

Using the same group of subjects, Laurence L. Frost, Ph.D., attempted to correlate Rorschach findings with physiological changes in the aging process. The clarity of the patient's perception, as measured by the Rorschach test, was examined in light of the measured functioning of the vascular system, the excretory system, and the central nervous system. No significant relationships were demonstrated at this time in either the vascular or excretory systems; however, it was found that a significantly greater number of generalized abnormal electroencephalographic recordings were found in those subjects with a low perceptual clarity. Patients with electroencephalographic records indicative of focal disturbances showed no differences in perceptual clarity.

Dr. Frost concluded that the elderly individual has at least an even chance of presenting a normal electroencephalogram, and his chances

High Points From Other Papers

Youth and Age

Modern culture views human growth with "lop-sided" values and overemphasizes the importance of youth and physical ability. The result is that little place is found in a mobile and aggressive society, except by accident or fortunate circumstances, for individuals in the postreproductive phase of life.

—Maurice E. Linden, M.D., and Paul Douglas Courtney, Ed.D., Norristown State Hospital, Norristown, Pa.

Work and Retirement

We are a labor-rich economy and the older worker is only one in a number of marginal groups. We should beware against keeping older men employed at supervisory levels at the price of the frustration of younger capable men. Men do start to fail, some of them early, and there is a certain rigidity in their points of view.

—Eli Ginzberg, Ph.D., director, Project on Conservation of Human Resources, Columbia University.

Yardsticks for Retirement

In this country we seem to discount the values of experience, wisdom, and judgment, and worship the prototype of the business executive with his great drive, dynamism, and ulcers. Performance and productivity are the only yardsticks a company can logically use as criteria of employment and retirement, rather than merely the potential physical capacity as shown in a medical examination.

—L. S. Barrus, Cleveland Twist Drill Company.

Psychosis Factors

Education, occupation, and the extent of indulgence in alcohol seem to be factors related to the psychosis of cerebral arteriosclerosis. Few highly educated individuals and a preponderance of those with little education, few professional and white-collar persons and more laborers and craftsmen have this psychosis. It would seem that these factors in a patient's life history may represent poorer personality integration and thus lessened equipment with which to meet the challenge of a growing impairment.

—Robert M. Naiman, M.D., Brooklyn Veterans Hospital.

are nearly three out of four of having a high degree of perceptual clarity. If the pattern of the EEG is abnormal, the probability of his having a high degree of perceptual clarity becomes much lower, dropping to one chance out of two.

Four Roles Of the Psychologist

Four distinct contributions that the psychologist can make in mental health programs concerned with aging were outlined in the symposium discussion by Sidney L. Pressey, Ph.D., professor of psychology, Ohio State University. The first contribution should be to determine and emphasize the potentialities as contrasted with the liabilities of the older years.

That retirement at 65 is arbitary, cuts off the work life of many substantially short of their potentialities, and creates numerous problems of mental health is increasingly recognized. If there are types of work and service in which older people may have substantial and sometimes especial competence, it is the second contribution of the psychologist to find and define these jobs and undertakings, find and appraise the appropriate old people, and bring the two together.

The third task for psychologists is to develop needed inventories and tests which are as specifically planned for work with older people as the equipment of a high school counselor is specifically designed for work with adolescents. The tests for a 60-year-old should be appropriate to him. The building of tests for the older years presents one of the few remaining measurement frontiers, said Dr. Pressey. The effort should be to develop tests of the especial and most distinctive strengths of the older years—tests of carefulness, judgment, the seeing of many relations and meanings, tests of disinterestedness, tolerance, patience.

High Points From Other Papers

Mortality Trends

The outstanding effect of medical science in the past half century has been the tremendous increase in the chances for survival of the individual. In the period from 1920 to 1930, the rate of mortality of the white population remained the same in the age groups of 50 to 65, 65 to 75, and 75 to 85 years. In the period from 1930 to 1940 and again from 1940 to 1949, the mortality showed a significant decrease in these older age groups, except for white males aged 50 to 65 years. The trends of these mortality rates indicate that survival and longevity of older individuals or of greater numbers of individuals over 50 should continue to improve.

—William Hall Lewis, Jr., M.D., Memorial Center, New York City.

The Aging Eye

The ability of the eye to restore its normal function after being fatigued by prolonged light stimulation and then subjected to a psychosensory stimulation, such as touch, sound, or threat of pain, changes significantly with increasing age. These changes are greater between the oldest and middle-aged groups than between the middle-aged and youngest groups.

—Lillian S. Kumnick, Ph.D., and Rev. Henryk Misiak, Ph.D., Department of Psychology, Fordham University.

Flicker Frequency

The critical flicker frequency, the rate at which flashes of light give the appearance of being steady, decreases with age at the same rate as other sensory and motor functions. Thus, when a young and an old person are looking at a flickering light, for example television, the old person will begin to see the light as a steady one more quickly than the younger person.

—Neil S. Coppinger, Ph.D., Veterans Administration Center, Wadsworth, Kans.

Brain Waves

The activity of the "brain waves" of older persons, as measured by the electroencephalogram, tends to become slower. Greater changes occur in subjects from 80 to 94 than in those from 65 to 80.

—Walter D. Obrist, Ph.D., Moosehaven Research Laboratory, Orange Park, Fla.

The general acceptance of changes in common points of view regarding the aged will require a continuing vigorous program of public education. Here is the suggested fourth role of the psychologist. Courses in the psychology of the older years should be as common as courses in child psychology in college and graduate school. In fact, a beginning should be made earlier, such as in secondary school home economics courses in family living. There should also be more public school adult programs and extension courses regarding the older years. If public attitudes toward age can be constructively remade, then indeed a major contribution to mental health in age will be made, concluded Dr. Pressey.

Mental Health Needs And the Community

The theory that a society that fosters research to save life cannot escape the responsibility for that extended life defines the attitude of the health worker, said Paul H. Stevenson, M.D., of the National Institute of Mental Health, in a symposium on community mental health. Public health occupies an "exposed" position in relation to the problems of aging, he said. But for the reduction in the communicable diseases and other medical advances, problems of aging would not exist. The public health worker recognizes the problem as a cooperative one, involving a large number of community agencies.

One of the important contributions of public health is the investigation of the peculiarities of the illnesses of later age—heart disease, cancer, cerebral hemorrhage, nephritis. These are "Fifth Column" diseases; to be discovered early they must be searched for. The psychological implications of these diseases cannot be discounted, said Dr. Stevenson.

More psychological insights focus-

High Points From Other Papers

Blood and Oxygen Consumption

With increasing age (40 to 95) there is a gradual reduction in the amount of oxygen required by individuals under resting conditions, although older individuals vary a great deal among themselves. The reduction in basal metabolism is largely due to a reduced uptake of oxygen from the lungs of older people rather than a change in the amount of air breathed by the subject.

—Nathan W. Shock, Ph.D., and Marvin Yiengst, B.S., National Heart Institute, Public Health Service.

Less blood and oxygen go to the older person's brain than to the younger person's. Brain cells do not increase their utilization of oxygen, if the amount of oxygen going to the brain is increased.

—Joseph Fazekas, M.D., Gallinger Municipal Hospital, Washington, D. C.

During our lifetime the rate of perfusion of blood through the tissues becomes lower, but for the most part the greatest decrease occurs between the ages 18 to 25.

—H. B. Jones, Ph.D., University of California, Berkeley.

Chronic Disease

The various chronic diseases appear to have some correlation with each other and with age. Coronary thrombosis, diabetes, obesity, and hypertension occur with each other more frequently than would be expected by chance.

—Dean F. Davies, M.D., Washington University School of Medicine, St. Louis, Mo.

Life Span

The upper limit of life has not been reached. As long as people die from diseases or injuries, the only answer to the question of physiological or ideal life span in man is that it is yet to be determined. Even so, two-fifths of all deaths in the United States in 1948 occurred after the age of 70 and one-sixth to one-fifth after the age of 80, permitting us to assume that the upper limit of life is beyond these ages.

—Raphael Ginzberg, M.D., and Vilma Olsvary, B.A., Gerontological Unit, Mental Health Institute, Cherokee, Iowa.

ing on the individual are needed, Dr. Stevenson said. New testing procedures must be found and old-age guidance centers equipped to make medical evaluations. Practically all community services will tend to preserve and maintain the ability of aging people to utilize their capabilities, he concluded.

Research Possibilities Almost Limitless

Oscar J. Kaplan, Ph.D. San Diego State Teachers College (California), closed the symposium with a discussion of research needs. He said we lack much of the information needed to design a community mental health program. We must recognize the complexity of the mental problems of the aged, for the aged often suffer from a number of different functional disturbances.

Research possibilities are almost limitless, said Dr. Kaplan, but research requires instruments. We need valid personality tests. Sample surveys may provide the tools for the study of mental health. We need more information on caring for senile persons in institutions, in old peoples' homes, and in the individual's home. We need to strengthen the bonds of the family.

Mental health depends upon physical health, home life, recreation, education, and economic security. Research in these aspects will help throw light on other problems of mental health. We need to inquire into the advisability of segregation of older persons. The entire world is a laboratory, said Dr. Kaplan. We should study the peoples of the whole world to grasp the sociology of later life.

Aging is one of our greatest social problems, yet the mental disorders of later life are not inevitable.

Program Planning For the Aged

Basic to all programing is a thorough knowledge of facts, Miss Ollie A. Randall, consultant, Community Service Society, New York, maintained in discussing programing for the aged. Efforts to bring about changes in existing services, she told the symposium audience, are regularly frustrated by mild tolerance and overprotection, ignorance and indifference, and the strong resistance to facing up to the so-called horrors of old age on the part of responsible people in the community.

A major problem confronting program planners is that of achieving proper balance in fixing responsibility for seeing to it that old people have a "good life." The final decision as to what is "good," especially in old age, is a personal one for each member of society, said Miss Randall. She warned against too great an overemphasis on "the aged" as a group and the creating of a "profession" of being aged. Segregation of older people for the purpose of services designed for them could be a disservice of the very worst kind. It has become the custom to isolate them in "homes for the aged"—safely out of circulation, in spite of the fact that more and more old people wish to remain in their own homes.

Older people want to go on working after they are no longer permitted to work full time, Miss Randall stated. Alternatives such as part-time work, or a different kind of work, or pensions present psychological difficulties to many older people. Social yardsticks must be revised, for work has a special meaning in our society. We shall never have a contented group of older people if they are assigned to a nonworking role which robs them of their social and economic status.

Failures in programing for health and medical care and for providing suitable housing are blamed on high costs, the lack of facilities adequate in number or in kind, the shortage of trained personnel, and the lack of concern for older people of the community at large and the professional groups in particular. There is also lack of appreciation on the part of old people of their own needs and the possibilities for meeting them.

Miss Randall concluded that the solutions to the major problems in programing for the aged lie in education of individuals as to the worth and dignity of the human being. Once this philosophy of human values underlies and permeates all programing and it is understood that there is no place in a free democracy for rivalry between the young and the old for the good things of life, the problems which beset the aged and their fellow planners will not be solved, but the way will be opened for solution.

PHS publications

Illness and Health Services In an Aging Population

This collection of four papers was presented at a session of the Second International Gerontological Congress, held in St. Louis in September 1951. These, with other papers from the congress, appeared in brief in the February issue of *Public Health Reports* (pp. 127, 130, 136, and 137).

Now brought together in their entirety in a single volume, the four articles provide comprehensive analyses of quantitative data on illness and health services in an aging population and throw light on disabling illness as one of the complex and interrelated factors which make it difficult for many persons to achieve reasonable health and happiness in old age.

The papers are: "Health Status and Health Requirements of an Aging Population," by G. St.J. Perrott, Marcus S. Goldstein, and Selwyn D. Collins; "Illness Among Older People in Hagerstown, Maryland," by Antonio Ciocco and Philip S. Lawrence; "Experience of the Health Insurance Plan of Greater New York With Its Older Enrollees," by George Baehr and Neva R. Deardorff; and "Health Services for the Aging in Saskatchewan," by Leonard S. Rosenfeld, Frederick D. Mott, and Malcolm G. Taylor.

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Illness and Health Services in an Aging Population. (Public Health Service Publication No. 170) 1952. 68 pages, tables, graphs. 25 cents.

Selected References on Aging. An Annotated Bibliography

This is a bibliographic selection of the most significant materials on the problem of aging that have appeared in the past several years. Compiled by the library of the Federal Security Agency for the Committee on Aging and Geriatrics, the bibliography affords a quick reference for both the layman and the professional worker and covers the basic thinking to date in this field. The titles are grouped under six main headings: social aspects of an aging population; economic aspects of an aging population; medical aspects of an aging population; general references and conference reports; conference and group discussion methods; and bibliographies. The references are annotated briefly except where the title is self explanatory.

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Selected References on Aging. An Annotated Bibliography. Federal Security Agency Committee on Aging and Geriatrics, Washington, D. C., 1952. 36 pages. 20 cents.

Diseases of the Heart And Blood Vessels

How important are diseases of the heart as causes of death in the United States? What types of cardiovascular disease are the chief killers? Has the death rate from diseases of the heart increased or decreased? Are race and sex important factors? What age groups are affected by these diseases? Have rheumatic fever and rheumatic heart disease deaths been going down? Do more people die in certain months or seasons of the year than in others? Is the Nation's manpower affected by diseases of the heart and circulation? How common is disability from these diseases?

The American Heart Association, in cooperation with the Public Health Service, attempts to answer the questions in a brochure which economizes on textual explanation but which accents the heart disease message through the skillful use of color in 12 statistical charts.

Usually, the most recent data included are for 1948, although in some instances 1949 and 1950 data are given. An example of the latter is a table showing the estimated number of deaths and death rates for specific diseases of the heart and circulatory system in the United States, for 1950.

The charts are preceded by a short glossary of heart disease terms.

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Diseases of the Heart and Blood Vessels—Facts and Figures. 16 pages. Single copies may be requested at no cost from the National Heart Institute, National Institutes of Health, Public Health Service, Bethesda 14, Md., and from the American Heart Association, 1775 Broadway, New York 19, N. Y. In quantity, order from the American Heart Association at $15.00 a hundred copies.

for the general public

Whooping Cough

Although whooping cough is often considered a mild disease, its dangers, particularly to children under 3, cannot be overemphasized. This health information leaflet describes the disease, its characteristic cough, and how it is spread. Care of the patient—isolation, proper rest and diet—are covered. Prevention of whooping cough by means of vaccination of children, preferably when 6 months of age, is stressed. Booster shots, or reinforcing doses of vaccine when the child is ready to go to school are recommended.

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Whooping Cough. Health Information Series, No. 60 (Public Health Service Publication No. 220). Reprinted 1952. 1-fold leaflet. 5 cents; $1.25 per 100.

Publications for which prices are quoted are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Orders should be accompanied by cash, check, or money order and should fully identify the publication (including its Public Health Service publication number). Single copies of most Public Health Service publications can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington 25, D. C.

Three Studies on Domestic Rats and Murine Typhus Control

Studies on rats and their ectoparasites in relation to murine typhus control are reported in detail in three papers published as Public Health Monograph No. 5 under the general title, "Domestic Rats, Rat Ectoparasites, and Typhus Control."

Part I. Domestic Rats in Relation to Typhus Control. By Harvey B. Morlan, M.S., Bernice C. Utterback, and Jack E. Dent.

This paper reports the composition of rat samples and the prevalence of typhus antibodies in rats by species, sex, and age, together with observations on rat behavior and reproduction. It includes information for students of rat ecology, and strengthens conclusions indicated by the gross data in previous articles.

The rat samples were divided into groups based on body length, weight, species, sex, and age. Roof rats (*Rattus rattus*) and brown rats (*Rattus norvegicus*) collected from one untreated and two DDT-dusted Georgia counties were studied, in both field and colony situations. A shake-down method of hand-catching rats proved to be a valuable supplement to usual trapping methods. Questioning occupants of premises being surveyed and using records of captures in relation to the number of traps set proved to be unreliable methods for estimating relative abundance of rats.

Sex ratios in the two rat species and the average body length of sexes within each species were similar. Samples were slightly biased in favor of large rats.

During three full operational years, complement fixation tests for murine typhus were completed for 18,959 rat serums. The average titer

Public Health MONOGRAPH 5

This summary covers the principal findings presented in Public Health Monograph No. 5, published concurrently with this issue of *Public Health Reports*. The authors are members of the staffs of the Public Health Service, Communicable Disease Center, Atlanta, Ga., the Center activities at the Oklahoma State Department of Health at Oklahoma City, and the department of zoological sciences, University of Oklahoma, Norman, Okla.

Readers wishing the data in full may purchase copies of the monograph from the Superintendent of Documents. A limited number of free copies are available to official agencies and others directly concerned on specific request to the Public Inquiries Branch, Public Health Service. Copies will be found also in the libraries of professional schools and the major universities, and in selected public libraries.

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Morlan, Harvey B., Utterback, Bernice C., Dent, Jack E., Wilcomb, Maxwell J., Jr., Griffith, Melvin E., and Ellis, Leslie L.: Domestic rats, rat ectoparasites, and typhus control. Public Health Monograph No. 5 (Public Health Service Publication No. 209). U. S. Government Printing Office, Washington, D. C., 1952. Price 25 cents.

level of positive serums from brown rats was consistently higher than that for serums from roof rats when species from two of the counties were compared. There were no regular differences between prevalence of antibodies between rat species; prevalence was similar in male and female rats; antibodies were more prevalent in adult rats than in young rats and in larger than smaller body length or weight groups.

Reproductive capacity in both species tended to be proportional to body length. Data suggest two peaks in the seasonal level of reproduction, the greater centered about March, the lesser about August.

An observed tendency of brown rats to supplant roof rats in parts of the study area raises an interesting question of possible effects on typhus epidemiology.

Part II. Ectoparasites of Domestic Rats in Relation to Typhus Control. By Harvey B. Morlan, M.S., and Bernice C. Utterback.

The extensive ectoparasite data collected during a study of murine typhus in southwestern Georgia are summarized in this paper. Observations on rats provided material for the preceding paper.

Four common species of ectoparasites, *Xenopsylla cheopis*, *Leptopsylla segnis*, *Bdellonyssus bacoti*, and *Polyplax spinulosa* made up 95 percent of the ectoparasites recovered from over 20,000 rats. Although *X. cheopis* is recognized as the principal vector of murine typhus, it appears desirable to investigate further the possible role of *P. spinulosa* as a supplementary vector of typhus among rats.

X. cheopis, *L. segnis*, and *P. spinulosa* infested higher percentages of brown than of roof rats, while the reverse was true of *B. bacoti*. Rats which were positive to the murine typhus complement fixation test were more frequently infested with *X. cheopis* and *L. segnis* than were negative rats. *X. cheopis* and *B. bacoti* normally infested young rats more frequently than adult rats. Percentages of rats infested with *P. spinulosa* were higher for male than for female rats.

In the untreated county, infestation of all rats with *X. cheopis* occurred in only 29 percent of 705 instances of multiple catches from the same building on the same day.

During and subsequent to DDT dusting, rats infested with *X. cheopis* were found on 11 to 76 percent of the treated premises compared to 81 to 90 percent infestation of untreated premises. Apparently, DDT dusting was less effective for female than for male ectoparasites. Higher percentages of females of both *X. cheopis* and *L. segnis* were found on roof rats than on brown rats. In the untreated county, the proportion of females of *X. cheopis* increased in months with a lower mean temperature and decreased in months with a higher mean temperature.

Part III. Commensal Rat Ectoparasite Collections in Oklahoma. By Maxwell J. Wilcomb, Jr., M.S., Melvin E. Griffith, Ph.D., and Leslie L. Ellis, M.S.

The ectoparasite and typhus records from commensal rat collections in 33 Oklahoma counties from November 1949 through June 1951 are presented in this paper.

During the study 1,051 rats were collected. Fifty of these were roof rats; the remainder were brown rats. The roof rats were free of ectoparasites; 758 of the brown rats which were collected alive yielded most of the ectoparasites. Mites, lice, and fleas were identified. Of the mites, *Laelaps echidninus* was the most abundant species. *Xenopsylla cheopis* infested 11 percent of live Norway rats. Most oriental rat fleas were taken from food, feed, seed, or grain-handling establishments in industrial districts.

Twenty of the blood specimens from 675 rats were positive for murine typhus. Four *X. cheopis* were found on an infected rat from one county and an average of 6.1 *X. cheopis* from 19 typhus positive rats collected in another county.

Two Studies of Plague

Results of plague studies by the Rodent-Plague Investigations Group of Colorado and a plague-typhus control unit created by the Communicable Disease Center of the Public Health Service and the Texas State Health Department in conjunction with the South Plains Health Department are reported in Public Health Monograph No. 6, "Plague in Colorado and Texas."

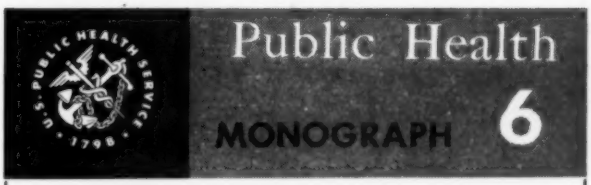
Part I. Plague in Colorado. By Dean H. Ecke, M.S., and Clifford W. Johnson, M.A.

The Colorado studies had three major objectives: to locate and study sylvatic plague epizootics, to determine the possible role of domestic rats in plague ecology in Colorado, and to determine the possible dangers to human beings from plague.

The history of human plague in the United States, beginning with the first recognized case in San Francisco in 1900, and theories on methods of spread of the disease are reviewed. Although there have been no proved cases of human plague in Colorado up to the time of this study, the disease has been demonstrated among rodents in the State for nearly 10 years.

The studies, carried out by an entomologist and a mammologist, centered in the Denver metropolitan area, with field work extending into 13 surrounding counties. The five major habitats in this area are described. Details are given of the methods, techniques, and equipment used in collecting rodents and their parasites. Whenever the collections were large enough to make computations reasonably accurate, statistical analyses were made to determine the monthly flea indexes for different species of rodents.

Thirteen species of Colorado mammals are listed, with information on their range, distri-



The accompanying summary covers the principal findings presented in Public Health Monograph No. 6, published concurrently with this issue of *Public Health Reports*. The authors are members of the staffs of the Communicable Disease Center of the Public Health Service at Atlanta, Ga., and the bureau of laboratories of the Texas State Department of Health, Austin, Tex.

Readers wishing the data in full may purchase copies of the monograph from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. A limited number of free copies are available to official agencies and others directly concerned on specific request to the Public Inquiries Branch of the Public Health Service. Copies will be found also in the libraries of professional schools and the major universities, and in selected public libraries.

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Ecke, Dean H., Johnson, Clifford W., Miles, Virgil I., Wilcomb, Maxwell J., Jr., and Irons, J. V.: Plague in Colorado and Texas. Public Health Monograph No. 6 (Public Health Service Publication No. 210). U. S. Government Printing Office, Washington, 1952. Price 30 cents.

bution, hibernation habits, fleas found on each species, and importance of each species of flea as a plague vector. Forty-one species of fleas are listed, with information on their host preference and medical importance. A check list of the wild mammals and their fleas encountered in this study is given in tabular form. Flea species are also listed according to species directly associated with primary reservoirs of plague in Colorado, species of possible medical importance (suspected of contributing to primary or secondary reservoirs), and species of no apparent importance in plague ecology as determined by this study. A table showing the locations of plague findings in Colorado counties from 1941 to 1949 is included.

Details of plague in Park County, Colo., are given, including history, effect of plague on rodents, plague-positive findings from field collections in the county, and an evaluation of rodent species and their fleas in regard to plague. A plague-like epizootic in Logan and Weld Counties is described.

Transmission of plague by nonrodent species—avian predators and scavengers, two mammalian predators, the badger and the coyote—and man's influence on the spread of sylvatic plague are discussed.

Methods used in making rat surveys in Denver and vicinity are described. Two maps of the area are included. The results of association of domestic rats with field rodents are discussed. Results of a survey of the rural rat populations around Denver are reported.

Means of human contact with plague in Colorado—direct contact with wild rodents, contact with plague-infected fleas from wild rodents, and direct contact with domestic rats and their fleas—are described. It is concluded that direct contact with infected rodents is the most probable method of transmission of plague from rodents to man.

Part II. Rodent Plague in the Texas South Plains, 1947–49, With Ecological Considerations. By Virgil I. Miles, B.A., Maxwell J. Wilcomb, Jr., M.S., and J. V. Irons, Sc.D.

The history of plague in Texas is reviewed, the methods and procedures used by the plague-typhus control unit in nine counties in the Texas South Plains, and the type of soil, principal crops, climate, habitat types, and small-mammal species in the area are described and discussed.

Findings of campestral plague in the nine-county area are tabulated by county, date, type of material examined, number of fleas in each pool of plague-positive material, number of hosts, and location—by nearest town, direction, and airline distance from place of collection. Species of fleas and their mammal hosts, their numbers, and months in which plague was found in fleas or tissues, are noted.

Results are reported of a thorough study, from an ecological standpoint, of an area in which most of the habitat types and animal species common to the South Plains were well represented, together with a map, divided into cultivated and uncultivated zones, on which are indicated the prairie dog colonies in the area, and the relation of such areas to plague epizootics among prairie dogs.

Previous Titles in the Monograph Series

No. 1. A methodology for environmental and occupational cancer surveys. W. C. Hueper, M.D.

No. 2. Tuberculosis in Iceland. Epidemiological studies. Sigurdur Sigurdsson, M.D.

No. 3. Head nurse activities in a general hospital, 1950. Apollonia Frances Olson, R.N., M.A., and Helen G. Tibbitts, M.A.

No. 4. Estimates of disabling illness prevalence in the United States. Based on the Current Population Survey of February 1949 and September 1950. Theodore D. Woolsey, B.A.

Compulsory Smallpox Vaccination

—*The University City, Missouri, Case*—

By NEWELL A. GEORGE, LL.M.

A recent court opinion in Missouri upholding the validity of a compulsory vaccination regulation indicates this subject is still a matter of active interest.

On August 5, 1919, the Board of Education of University City, Missouri, adopted for the first time a compulsory vaccination regulation. The regulation was amended by the school board on February 7, 1929. Since the 1929 change, the regulation has provided:

> No child shall be received into any public school unless he has been vaccinated against smallpox and evidence thereof sufficient in the judgment of the superintendent has been presented.

Court action to test the validity of the regulation of the University City Board of Education was filed in January 1952 by the parents of twin daughters. When their daughters were 5 years old the parents presented them to the public school and sought to enroll them in kindergarten classes. Entrance was refused when the parents would not permit their daughters to be vaccinated. The following year the parents again sought to have their children enrolled in the public school and their entrance was again refused. The failure of the parents to have the twins vaccinated and the refusal of school authorities to permit their entrance precipitated the filing of a misdemeanor charge against the parents for violating the compulsory school attendance law of the State of Missouri. This criminal case was tried on an agreed statement of facts and the parents were acquitted.

On January 29, 1952, a mandamus action was filed in the Circuit Court of the County of St. Louis to compel the members of the Board of Education of University City to enroll the twin girls in the public school system or to show cause why they should not be so enrolled. It was alleged that the parents were resident taxpayers of University City; that they were the parents of twin girls, then 7 years of age; that the children had been presented for enrollment on numerous occasions; that enrollment had been refused for the reason that the children had not been vaccinated against smallpox; that the children had not been so vaccinated because such vaccination would have impaired their health; that there was neither an actual nor a threatened epidemic of smallpox in the area; that the refusal of the school board to admit the children was unreasonable, arbitrary and capricious, and constituted an abuse of discretion; that the parents were unable to pay to have their children educated in a private school; that the parents faced criminal prosecution unless the children were admitted; and that they were without an adequate remedy at law unless the court granted the writ prayed for.

The answer of the school board admitted many of the parents' allegations. The school board, however, denied that vaccination would impair the health of the children; denied that

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Mr. George, regional attorney for the Federal Security Agency at Kansas City, Mo., is a member of the Bar of the State of Kansas and of the District of Columbia.

there was no actual or threatened epidemic of smallpox in the area; denied that the refusal of the school board to admit the children was unreasonable, arbitrary and capricious, or was an abuse of discretion; and denied that the petitioners were without adequate remedy at law.

The school board further stated that at all times when the children were presented for enrollment the school board had in effect a rule requiring all children to be vaccinated against the disease of smallpox, but that a child could be admitted to the public schools if the child's parents presented to the proper authorities a written statement, signed by a licensed physician, to the effect that vaccination would be injurious to the health of the child. The answer further stated that the rule in effect had the approval of city, county, and other authorities; that the disease of smallpox is very contagious and results in serious illness and frequently death or permanent disfiguration; that it spreads rapidly and is readily contracted by groups of persons; and that it has been the public policy of the school and health authorities to require all persons to be immunized against the disease by vaccination in order to prevent epidemics from spreading throughout the United States. It was prayed that the alternative writ be quashed and that the preemptory writ be denied.

Because of the fundamental legal, medical, and social questions involved in this case, the attorney representing the school board secured as witnesses experts qualified to present the clinical, laboratory, and epidemiological knowledge of smallpox to the court.

The case was tried in the circuit court of St. Louis, Mo., April 28, 1952. Since the basic facts had been agreed upon, the attorney for the parents of the twins took only one hour for his presentation. The attorney for the school board then called his witnesses, all of whom were specialists in public health or in related fields. Each physician testified regarding the deadly and devastating effect of smallpox and the rapidity with which it spreads. Once infection occurs in a community, they advised the court, a person could become infected and transmit the disease before he himself noted symptoms.

One physician, after qualifying as an expert witness, testified as to the effect of smallpox upon the human body, the improbability of a cure without injury to the person, and that the best method known to medical science to lessen the liability to infection from smallpox is by vaccination. Thereafter, upon stipulation by counsel, each witness, after qualifying as an expert, was asked if his testimony would agree with that previously given. All answered in the affirmative.

After the last witness had testified, counsel for the school board summarized the testimony of the expert witnesses. He emphasized the point, made repeatedly in testimony, that, although there was no outbreak of smallpox evident in the area, the surest way of preventing one is by vaccination before it occurs. The trial was then adjourned.

One week later the judge of the thirteenth circuit handed down his opinion:

THE CIRCUIT COURT OF THE COUNTY OF ST. LOUIS

STATE OF MISSOURI, DIVISION NO. 2

No. 194,776

STATE OF MISSOURI, EX REL., AND HENRY MOREY, ET UX., REALTORS

v.

WILLIS REALS, ET AL., RESPONDENTS

Memorandum

"This is an action in mandamus brought by Henry Morey and Delma Morey, parents of twin girls now 7 years old, against the respondents, members of the Board of Education of the School District of the City of University City, to compel said school board to accept relators' children into the University City schools without vaccination against smallpox.

"In the petition it is stated that 'said children have not been vaccinated against smallpox for the reason that such vaccination would impair the health of the children.' No evidence was introduced to support this allegation and it is therefore no longer an issue in the case.

"The only issue remaining for determination arises as a result of the allegation in the petition 'That such failure and refusal on the part of Respondents to admit the said children of the

Smallpox cases and deaths in the United States, 1900–1950

Petitioners to the Public Schools of the City of University City, Missouri, is unreasonable, arbitrary, and capricious, and is an abuse of discretion on the part of Respondents.'

"It is uncontroverted that the schools of University City have an enrollment of more than 5,000 children, and that the school board now has, and for many years has had, a rule requiring all children to be, or to have been, vaccinated against smallpox before admitting them into the schools. It is also conclusively shown that there is not now any smallpox epidemic, nor any threat of such epidemic, in St. Louis County.

"The question for determination by this court is whether the rule requiring vaccination at a time and place where there is no epidemic or immediate threat of epidemic is an unreasonable requirement, or whether the school board in the exercise of a proper discretion may enforce such rule for the purpose of seeking to prevent such an epidemic from arising.

"The courts of our State have always recognized the right of the school boards of the State to make reasonable rules for the regulation of their respective schools.

"Many years ago, long before the efficacy of vaccination as a means of prevention had been so generally accepted, Judge Rombauer in the case of In re Rebenack, 62 Mo. App., 8, said 'In the nature of things, it must rest with the boards of education to determine what regulations are needful for a safe and proper management of the schools, and for the physical and moral health of the pupils entrusted to their care. If such regulations are not oppressive or arbitrary, the courts cannot, or should not, interfere.'

"It is only in the case of an abuse of discretionary powers of a board invested with authority to regulate, that the court will undertake to supervise official discretion. How far the right to exclude one for the good of the many should be carried is also a question addressed to the discretion of the school board; and when that discretion is honestly, reasonably, and impartially exercised the courts should not interfere.

"In the trial of this case the court had the

benefit of the opinions of a number of outstanding specialists in the field of public health and the control of communicable diseases. It was their testimony, without exception, that while there is no known cure for smallpox, the remarkable reduction in the cases of that dread disease is attributable to the present general acceptance and the proven preventive effectiveness of vaccination, and that any relaxation of rules requiring such vaccination would to the extent of such relaxation increase the danger of the introduction of the disease into the schools.

"The doctor in charge of the Bureau of Communicable Diseases of the Missouri Department of Health testified that in 1937 there were 1,751 reported cases of smallpox in our State. From that year the number of reported cases dropped markedly and in the past 9 years the highest number of reported cases for any year was 11. Indeed he testified that in 1950 and 1951 only two cases were reported for each year.

"In the light of testimony so overwhelming and statistical information so convincing of the protective value of vaccination against this once prevalent disease, the court must hold that the respondents are wholly within the exercise of a sound discretion in adhering to their rule requiring vaccination of children in their school system."

John A. Witthaus, Judge.

PHS films

High-Temperature Short-Time Pasteurization

16 mm., sound, black and white, 21 minutes, 1951.

Audience: Milk sanitarians and control authorities responsible for milk sanitation programs and policies.

Available: Loan—Communicable Disease Center, Public Health Service, Box 185, Chamblee, Ga. Purchase—Castle Film Division, United World Films, 1445 Park Avenue, New York 29, N. Y.

This film was designed to aid in training inspection personnel in the proper procedures for testing the functioning and accuracy of high-temperature, short-time pasteurization controls, in accordance with the regulations of the standard milk ordinance.

After stressing the fact that milk pasteurized by the high-temperature, short-time method is absolutely safe only if it is heated to at least 161° F. for a period not shorter than 15 seconds, this motion picture depicts the procedures, theory, and observations enabling a milk sanitarian to inspect, test, and understand the complex equipment that controls the pasteurization of milk by this method. The main tests and procedures shown and explained are: (1) checking the accuracy of the indicating thermometer; (2) testing the functioning of recorder-controller and sealing adjustment in conformance with regulations; (3) seeing that the pasteurized milk pressure in the regenerator is higher than that of the raw milk; and (4) checking the accuracy of the diversion valve and calculating the duration of the holding time.

Biology of Domestic Flies

16 mm., sound, black and white, 9 minutes, 1952.

Audience: Professional, scientific, and technical personnel of health departments and other professional personnel engaged in or interested in community fly control.

Available: Loan—Federal Security Agency, Public Health Service, Communicable Disease Center, Box 185, Chamblee, Ga. Purchase—United World Films, Inc., 1445 Park Avenue, New York 29, N. Y.

This film, one of the community fly control series produced by the Communicable Disease Center, Public Health Service, supplies information on the habits of the most common varieties of flies in order to facilitate community fly control programs. The content of the film covers the following subjects:

1. Life cycle of the housefly.
2. The characteristics of domestic flies (houseflies, blowflies, fleshflies, and stableflies) compared and contrasted.
3. Typical breeding places and radius of areas of control and measures as determined by the flight range of flies.
4. Public health implications of the fly's mechanisms for transmitting disease organisms and filth. (Flies ingest only liquids. They regurgitate bacteria carrying liquids in order to dissolve and make available solid foods. They also deposit germ-laden excreta—fly specks—on food and other surfaces.)
5. Habitual fly resting places under varying conditions of time and weather and how familiarity with fly habits aids effective control through residual and space spraying with insecticides.
6. The development of strains of flies resistant to insecticides after a series of several spraying campaigns.

NOTE: Filmstrip No. FS0, "Biology of Domestic Flies," 35 mm., sound, color, 9 minutes, 81 frames, released 1952, is also available for presenting the same material as is shown in this motion picture.

Psychological Impact of Cancer Surgery

By ARTHUR SUTHERLAND, M.D.

The problems involved in management of the cancer patient have been radically altered during the past few years by the striking advances in therapeutic techniques. Operative mortalities are being reduced to a minimum. Postoperative medical control has been vastly improved, and operations on patients who not so long ago were considered inoperable are now routine. Not many years ago, the long-term survivor of a cancer operation was considered a unique phenomenon, and therapeutic emphasis was centered on symptomatic management of the terminal cancer patient. Modern therapeutic methods have created an increasingly large army of survivors. It would seem that the problems of the cancer patient would be solved by his survival alone, but unfortunately this is not so. Advances in treatment, like all other advances, have created problems. Unfortunately, the extensive surgery which is necessary for the control of many forms of cancer results in major changes in form and function of various parts of the body. These changes are often disfiguring or mutilating and are not lightly borne by the average patient. They present challenges to his capacity for adaptation in all areas of living, and at times the problems created may appear overwhelming. The result is the therapeutic paradox of patients cured of cancer and clinically well who are able to function only in a very circumscribed way or not at all because the methods necessary for cure have resulted in psychological invalidism.

Dr. Sutherland is an associate attending physician and psychiatrist at the Memorial Hospital, New York City. *This paper was presented at the National Cancer Society's program, National Conference of Social Work, Chicago, May 27, 1952 (see Public Health Reports, October, p. 955).*

Practical Management

Little systematic study has been done on the impact of cancer and the attending surgical procedures to guide the clinician and others associated with him in the practical problem of managing the postoperative cancer patient in his total situation. The Memorial Hospital in New York has established a group to study these problems. This group, consisting of psychiatrists, internists, psychologists, psychiatric social workers, surgeons, and nurses from the various clinical departments of the hospital, has found it advisable to concentrate its attention on certain types of cancer and certain classes of operation. Much of its information is highly particular and has to do with the specific problems met by each patient in the class of operation studied. Nevertheless, certain general conclusions can be drawn which apply to the whole field of cancer and, indeed, to any surgery where serious change in form and function of the body results.

Apparently much of the emphasis in current rehabilitation practices concerned with the psychological management of the patient with any sort of serious disability is misdirected. There seems to be a tacit assumption that the only real problem is the patient's belief that he has problems; therefore, therapeutic effort should be directed toward persuading him that he has no serious problems or at least to minimizing those he does have. This approach, even when fortified by all available clichés, is rarely effective because it is totally unrealistic.

The patient has very real, very immediate problems to solve which must be solved by him, alone or with the help of others. But solved they must be if the individual is to return to his previous ability to function and to emotional peace. It is when these problems are not solved that psychological invalidism occurs.

The approach based on the denial of the existence of problems has an underlying quality of contempt and condemnation for those patients whose problems will not be denied. It describes invalidism in terms of deterioration of moral fiber, of "loss of independence," and of "regression." It fails to recognize that retreat from function is the result of inability to master the problems created by the traumatic event, and that function is resumed when the problems are solved. As a matter of fact, the so-called loss of independence and regression are often necessary to the process of repair. They are to be accepted and not penalized in any way. They are in lieu of more serious disorganizations attendant upon attempts at function without the hope of mastery. The dictum "it's what's left that counts" is true as far as it goes, but it is at least equally true that the loss of a significant body part—an arm, a breast, a stomach, or a rectum—in the mind of the patient calls for a fundamental review of his ability to function normally.

Adjustment to Cancer

One cannot speak of "adjustment" to cancer because this concept is too abstract and general to be meaningful. Each patient must be considered as an individual with a particular type of cancer—an individual who has undergone a particular form of surgery or other therapy. In the first place, there is no special psychology of patients in whom cancer develops. Cancer happens to all types of people: people who are more or less "normal," people who have character neuroses—neurotics, psychotics, and psychopaths. It does not, as far as we know, select particular kinds of emotional problems. Moreover, cancer itself is not a uniform disease. It can vary from a basal cell carcinoma with almost no possibility of mortality to a highly malignant, rapidly growing tumor which can defy all methods of control. Cancer can necessitate the removal of almost any organ in the body, organs which play varying roles in the total life adaptation of the patient. The necessary surgery results in a considerable variation in form and function of the affected organs. One cannot easily separate adaptation to cancer from adaptation to measures needed for its cure. In the vast majority of patients, the threat or fear of cancer is submerged in the problems of adaptation required by the extensive change in form and function produced by surgery.

Adaptations to these procedures are by no means static. Actually adaptations begin with the patient's discovery of something wrong with his health. They progress for better or for worse during the preoperative course, reach a culmination in the crisis of surgery, and then evolve during the postoperative and convalescent period towards the long-range, more or less final resolutions. Moreover, they are not at any time independent of concurrent life situations, but, on the contrary, both concurrent life situations and the patterns of adaptation fundamentally influence each other. Mrs. A., for example, has an abdominal colostomy, that is, an abdominal anus through which she must evacuate her bowel movements and over which she has no voluntary control. She accomplishes this by regular, repeated irrigations. For 12 years she was able to manage these irrigations with almost no spilling and was able to work regularly. But when she came into conflict with her daughter, she developed uncontrollable diarrhea so that she was continually soiling herself. Because of this she had to give up work, became increasingly depressed, and hoped for death. When her emotional and practical problems were straightened out, she was again able to reestablish control over the colostomy and resumed her previous activities.

Psychology of the Cancer Patient

In general, the psychology of the cancer patient is the psychology of a person under a special and severe form of stress. Cancer is usually perceived as lethal and as a particularly gruesome form of death. It is almost always intertwined with the necessity for major surgery. Stress of this sort activates childhood and infantile irrational fears as well as

realistic fears. There is a chance of recurrence of cancer. There is a chance of serious postoperative complications and operative death. The fear of some form of mutilation in surgery is very real, and the patient may feel overwhelmed by his anticipation of how seriously handicapped he may be.

The problems inherent in infancy and childhood are all more or less solved by patterns of adaptation related to the specific difficulties experienced. The diagnosis of cancer, the surgical experience, and the residual mutilation or deformity which follows surgery can either threaten or disrupt these adaptational patterns and activate the conflicts which they were designed to resolve. Consequently, many fundamental underlying emotionally charged convictions are brought close to the surface. The notion that mutilation is a form of punishment for sin, or fears of abandonment are common themes. For example, a woman whose mother had interdicted marriage and motherhood for her was subjected to a pelvic exenteration for carcinoma of the cervix uteri. She felt, and stated, that her mother had finally caught up with her and punished her for having married and having a child. Another woman with carcinoma of the breast stated that she had loved her body too much and was being punished.

Indeed, the impact of the experience and the changes produced by surgery may be felt by the patient indirectly and only as a reflection of the change produced in the attitude of some significant family member such as the spouse. The marital partner may be wholly unable to accept the changes in form and function, and consequently reject the patient. Instances have been known in which wives have refused any sexual contact whatever after the husband's operation.

Whenever stress of this sort occurs, it calls forth defensive measures. Such responses are quite characteristic for the individual and are more or less specific for the type of stress. The mechanisms of avoidance and denial are frequently invoked, especially preoperatively. Avoidance is a fairly common mechanism, based on the premise that if one makes something explicit it becomes true, and as long as something is kept out of mind, there is no need to worry about it. Denial is a more forceful rejection of the entire threat; some women have refused to recognize that they have lost a breast or a rectum for a considerable time after the operation. A woman with an extensive pelvic cancer, which was later cured by pelvic exenteration, denied the implication of entrance to three nursing homes for terminal cancer and signed out of all of them on one pretext or another, in order to maintain the denial.

The patient may believe himself overwhelmed by the threat to his safety or to his ability to function and may become seriously depressed. He may show signs of being disorganized; he may be unable to decide on reasonable courses of action. This state of mind is usually accompanied by profound feelings of dejection, a sense of helplessness, a retreat from function, and at times by suicidal thoughts. When a patient is in this anxiety-ridden state, he turns desperately to other people for help and loses his "independence." He seeks advice, consolation, and reassurance from others. He seeks their help in making decisions and in solving problems. It should be emphasized that in the majority of patients depression and concomitant dependence are to be expected, but are only temporary. They can be regarded as a prelude to the process of repair. How temporary they are is dependent upon the amount of help the patient obtains in solving his real life problems, in the reintegration of his primary adaptive mechanisms, and in the restitution of function in the various significant areas of living.

Depression and dependence form the essential core of what is generally referred to as "regression." The patient should not be penalized because of these conditions. Rather, the problems which gave rise to them should be met. The patient may not be able to solve them alone unless he has adequate help, and chronic long-standing depressions, restriction of function, and pathological dependence may persist. Only too often he does not receive adequate help from professional sources and is left wholly on his own or receives from friends and family well-meant but inappropriate advice. Kindness, acceptance, and support, especially from professional persons, have been proved over and over again to be of great significance to the patient. They give him the security

that he needs to face the problems of later resumption of function. It should again be emphasized that marked dependence does not persist for long periods of time except in rare instances. The problems of long-term dependence are, as a rule, few. The majority of patients are content merely to know that there is someone on whom they can rely and with whom they can discuss their problems, even though they do not avail themselves of this privilege for months on end, if at all.

A patient at times attempts to master his difficulties by direct frontal attack, by sheer force of will. This is in effect a form of denial of limitations on his own power. When this process is not guided, it may result in inappropriate solutions which can be bizarre or inefficient, or it can result in failure, with accompanying intense feelings of defeat. As a matter of fact, overly enthusiastic attempts at mastery are closely akin to elation and are often a thin veneer for a very profound depression.

The belief that one has sustained a serious injury, often held by patients who have had extensive surgery, is usually associated with considerable resentment which, unfortunately, has no logical object. The physician is often seen unconsciously, or at the margin of awareness, as the injuring agent, but he is also regarded as too powerful or too necessary to offend. Consequently, resentment is often misdirected toward persons in the immediate environment—on nurses and social workers or on members of the family. Resentment is usually manifested by querulousness, a demanding attitude, complaints, and other manifestations of hostility. It often includes feelings of being the victim of others' hostility and, indeed, may be frankly paranoid. Irritating as this state is to those who handle the patient, it should be regarded as a part of the normal process of repair, although at times a miscarried process. When the anger and resentment can be vented and worked through, they do not persist as a permanent adaptive pattern.

The social worker is in a peculiarly advantageous position to aid the patient in his struggles to resume function. She can determine the real limitations imposed by the circumstances of the surgery and other therapy. She can mobilize community resources for the benefit of the patient or his family. Her training in case work has taught her the proper approach to the emotionally disturbed patient. She can accept the patient's dependence and help him voice the resentments and fears on which his dependence is based. She can interpret his needs to his family and other important persons in his environment. She can strengthen or repair significant interpersonal and family relationships. Moreover, she can interpret to the physician and the surgeon the needs, both material and emotional, that the patient may have. Her professional status makes her an authoritative source of reassurance. Her training in meeting people's needs and helping them to solve practical problems makes her a very valuable ally for the patient in his struggle to resume his previous life.

Adaptation of the Patient

The surgical experience itself is probably crucial to the long-range adaptation of the patient. In the first place, a fairly large percentage of patients regard any major surgery as having a high probability of being fatal, or at least mutilating. Frequently, the extensive removal of body parts, especially of organs significant to the patient, is believed to be incompatible with health or vitality. When this conviction exists, surgery is approached with a keen expectation of serious injury, signaled by anxiety, confusion, and sometimes despair. It is when the expectation of injury becomes changed postoperatively into a belief that serious injury has taken place that problems of hypochondriasis and depression are most severe. The individual believes himself too enfeebled or frail to resume his premorbid functioning; consequently there is restriction of function, frequently in all areas of living. Unless these feelings are dealt with adequately when they manifest themselves, depression and invalidism may be permanent. As one patient said, "I have lost confidence in my body."

As yet no means are available to predict which patients will do well psychologically and which ones will not. No reasonable prediction can be made preoperatively that the patient fits into some particular diagnostic classification. As a matter of fact, neurotic or

psychotic mechanisms may be an asset in the total situation. When they are not disrupted, such mechanisms may shield the patient from the impact of the experience or enable him to resume function with little difficulty. A schizophrenic boy who underwent an amputation of the arm and shoulder for a bone tumor had little trouble in accepting this disability because it remained peripheral to his central problems of his own sexuality and his mother. No prediction can be made on the basis of gross adaptation, such as the fact that the patient seems to be a "well-balanced individual and a solid citizen." The physician must know exactly how this experience will integrate with or disrupt the patient's major patterns of adaptation. This is usually far too subtle to be determined before the event. Moreover, the final adaptation cannot easily be predicted on the amount of preoperative anxiety alone.

It has not been possible to develop instruments or tests to differentiate sharply between those who need help and those who do not. All patients who undergo major surgery with serious change in form and function such as that used routinely to manage and control cancer need help at some time in their course, particularly around the time of surgery.

Summary

The problems to be met in managing the cancer patient today are quite different from those of a few years ago. Operations which were considered impossible a short time ago are now routine, and postoperative care has been much improved.

All types of people have cancer. Each patient must be considered in the light of his individual problems; each one must make his own adjustment to the circumstances of his particular kind of cancer and its treatment.

No prediction can be made preoperatively of how the patient will react to surgical experience. No instruments or tests have been developed to differentiate sharply between those who will need help and those who will not.

The psychology of the cancer patient is the psychology of a person under a special and severe form of stress in which many fundamental underlying emotionally charged convictions are brought to the surface. Stresses are often met postoperatively by avoidance or denial, or depression and dependence may develop which the patient may not be able to overcome without help. Such problems can best be met by professional persons. The social worker is in a very advantageous position to aid the patient in his effort to resume normal functioning following surgery.

Psychosocial Aspects of Cancer

Two papers in this series, in addition to those appearing in this issue, were published in the October 1952 issue of *Public Health Reports:*

Professional attitudes and terminal care, by Charles S. Cameron, pp. 955–959.

Typical patient and family attitudes, by Addie Thomas, pp. 960–962.

A fifth article will be published at an early date.

The Sequence of Emotional Reactions in Radical Mastectomy Patients

By MORTON BARD, M.A.

At the Memorial Hospital in New York, we are in a position to observe the emotional reactions of large numbers of mastectomized women since an average of 580 radical mastectomies are performed each year. Our clinical observations have led to a number of formulations.

In the United States, the female breast is the most common site of cancer. It has been estimated that 4 percent of the adult female population develops the disease. Radical mastectomy is a universally accepted treatment of breast cancer and involves the removal of the breast, pectoralis major and minor muscles, and the axillary contents.

Public knowledge of the symptoms and treatment of breast cancer is more widespread than for other forms of cancer. The symptoms of breast cancer cannot be easily attributed to other illnesses as can the symptoms of rectal or gastric cancer. Most women in our society are aware that a painless mass in the breast is a pathological sign. Furthermore, they have known either relatives or friends who have had a radical mastectomy. Unfortunately, women who have had a mastectomy and are free of recurrent disease rarely allow others to know about it. Those who die from recurrent disease, despite surgery, are the patients more generally known in the community. As a result, many women regard the prognosis for breast cancer as unfavorable even if treated.

When a woman discovers a mass in her breast, she is likely to recall every unfortunate incident involving breast pathology known to her. As soon as she is aware of the symptom, a sequence of emotional reactions and reality events begins. The sequence can be characterized as consisting of four stages: onset of symptoms, diagnosis, hospitalization for surgery, and convalescence. Each phase contributes to the patient's ability to integrate the total experience, and, modified by her lifelong adaptations in living, sets the tone of her postoperative reactions.

Onset of Symptoms and Diagnosis

When the symptom of breast cancer is recognized, the patient immediately begins to anticipate what she believes is going to happen to her during the treatment process. The individual meaning of the suspected disease and surgical treatment serves to mobilize the patient's anticipatory anxieties and preparatory resources. Often, the symptom arouses such acute anxiety that the patient delays seeking medical attention. Or, if medical help is sought, a series of defensive maneuvers may be initiated to avoid the inevitable treatment process. Fortunately, many women are able to seek medical attention and carry through the necessary treatment.

This does not mean that these women obtain

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This paper was presented on the American Cancer Society's program at the National Conference of Social Work, Chicago, May 27, 1952 (see Public Health Reports, October, p. 955).

medical treatment without great emotional cost to themselves. Because of the amount of information which most women have about breast symptoms, the most frequent concern of the patient is whether or not she has cancer. To most, this concern can be equated with, "Do I have that invariably fatal disease?" However, other important fears may also be activated when the symptom is first discovered. Concern about recurrence if the diagnosis should prove to be cancer is often experienced even before treatment is initiated, or concern about mutilation if surgery should prove necessary is expressed. Some women are particularly worried about the effect of the entire experience on their families—"What will happen to my children when I'm in the hospital or if I die"; others cannot specify their fears—"I'm just scared and I don't know why." With the onset of symptoms, then, the patient immediately begins to anticipate the disease and its treatment.

On the day that the diagnosis is established and the patient is informed of the necessity for surgery, all of her anticipatory fears are brought clearly into focus and invested with reality. Whether or not the patient is told she has cancer will depend on the interaction between the physician's convictions about imparting information to cancer patients, and the patient's insistence to be told details. In either case, however, the patient's dread begins to mount slowly and progressively.

Hospitalization

The day of admission to the hospital has tremendous significance. On this day patients are frequently in a state of panic. The awesome, impersonal routine of preparation for surgery is in itself frightening. Patients interviewed on this day express feelings of being trapped and helpless. Some patients actually telephone their families and request that they be taken home as a last desperate effort to thwart the threatening environment. If they are clinic patients and are placed in a breast ward, they will selectively perceive the operative experience of others. The patient's experiences on the day of admission to the hospital reinforce the fears which arise at the onset of symptoms.

Immediately before surgery, specific fears concerning anesthesia are expressed. A majority of patients insist that total anesthesia must be induced before they can possibly undergo surgery. Some patients ask that they be "completely out" even before going to the operating room. Other patients express fear of losing consciousness as a result of anesthesia. All of the feelings regarding anesthesia are indications of integrative attempts to deal with an overwhelmingly threatening life situation and, again, are very individual.

Other reflections of tension or panic occur prior to operation. Eating patterns are usually disturbed, and restful sleep the night before surgery is an impossibility for most patients, sometimes even with sedation. Dreams occurring on the night before surgery are usually nightmares of intense horror. For example, one patient reported that in her dreams she found herself in a butcher shop with female breasts suspended from meat hooks all around her, although her own breasts were intact. This dream and others of an equally horrible nature emphasize the anticipatory fears of surgery.

Postoperative reactions also attest to the nature of the experience. Once again, horror dreams are frequently reported. Gross physiological reactions, such as excessive perspiration and tachycardia, are manifested. Most patients have difficulty in eating after surgery; they are unable to swallow food, or they have lost their appetites. Again, there are a variety of sleep disturbances: inability to fall asleep, early waking, fitful and restless sleep, and arising fatigued. During the day, some patients sit quietly, sometimes crying, without participating in any ward activity; others are overactive, often eagerly helping nurses with their work.

The gross physiological reactions, disruption of eating and sleep patterns, the dreams, and ward activity all comprise a response to a hostile and injuring environment. These reactions, with marked individual variation, are actually a watchful mobilization of inner resources to prevent further injury. One author has succinctly said that, " 'the operation' is a milestone—if not a tombstone—in the life of an individual."

Convalescence

"Going home" is viewed with a variety of reactions. Some patients are eager to see their children and families again and feel that only then, with home care, will they be able to recuperate properly. For these patients, family and friends represent the support and warmth they feel cannot be realized in the sterile and symbolically mutilative atmosphere of the hospital. Other patients, however, are not eager to return home either because of feelings of weakness or because they feel unable to "face people." These patients are relating the surgical result to a social context and feel that even the impersonal hospital environment is less threatening than projected fears of social inacceptability.

Following discharge from the hospital, some patients return to their own homes; others to the homes of relatives or friends. Usually, there is a period of rest, which involves staying in bed and a total withdrawal from ordinary activities. The length of time and the extent vary, but withdrawal occurs in almost every case. Some patients insist on others caring for them; others are equally insistent on performing some activity for themselves. Although the actual surgical experience is over, the feelings aroused by it remain active. Many patients complain that their families and friends refuse to discuss the operation "in order that the patient may forget." These patients resent this attitude and feel they would be greatly relieved if everyone would accept the fact and refer to it as they would to other experiences in life. On the other hand, some patients do not wish to discuss the experience at any time. These patients very quickly become hyperactive—doing anything to prevent thinking about the experience.

Regardless of the adaptation a patient achieves in attempting to resolve her feelings about the total experience, support and understanding by her family have an enormously significant role. Some patients report that their families have risen to the occasion by being more overtly understanding and supportive in recognition of the patient's traumatic experience. One woman expressed the feeling that she had never before completely understood how important her family was to her and how deeply they loved her. This woman was able to resume full functioning very early, ascribing her ability to do so to her family's feeling toward her. The recognition by any woman that she is loved and needed by people who have an important role in her life gives her a sense of value which goes far in restoring the self-esteem lowered by the mutilative surgical experience.

Often, women perceive their bodies as the basis for value in interpersonal relationships. These women relate to their husbands through physical attractiveness. When they feel their bodies have been made ugly by a radical mastectomy, profound feelings of self-rejection may develop. Even if the husband actually remains affectionate and supportive, the patient may feel she has disrupted the relationship and stands in danger of losing him as a result. When this occurs, the lack of self-esteem is projected as the husband's attitude despite his actual expression of feeling. In one instance, a woman reported how kind, warm, and sympathetic her husband had been since surgery, but, nevertheless, she dreamed that he abandoned her.

The occurrence of postoperative physical complications, such as infection or difficulty in healing, constitutes an additional threat. Most women view any complication as evidence of recurrent disease and the need for additional surgery. Acute anxiety and sometimes depression is precipitated by these events. A large number of mastectomy patients are in constant dread of losing the remaining breast. Often, radical mastectomy patients experience painful sensations in the remaining breast, and sometimes actual enlargement of the breast even in the absence of disease or any other physiological finding.

The Experience in Context

The entire experience of the mastectomy patient from the onset of symptoms to the convalescent period has been elaborated. The meaning of loss of a breast to a woman, however, cannot be abstracted out of the context in which the loss occurs. The entire experience involves a series of adaptations which is, in turn, intimately related to the adaptations in

living which the patient has previously made.

It is true that the loss of a breast constitutes a blow to femininity, but femininity has a different meaning to each woman. To the patient who is extramaritally promiscuous, femininity means something quite different than it does to the woman who is as yet chaste and unmarried at a relatively late age. The statement that postclimacteric women will have a more emotionally tranquil course than will younger women who have not fulfilled their goals of marriage and motherhood is an equally meaningless generality since the breast acquires individual meaning to each woman based on her resolution of fears pertaining to the achievement of heterosexuality and motherhood. Some women integrate the breast into a framework of self-esteem in feminine function. Others, on the other hand, integrate the breast as a defense against a feeling of worthlessness as women. These resolutions and defenses are active throughout the life of the woman and do not mysteriously disappear with menopause. The impact of breast amputation upon a woman, therefore, will depend less on her age than upon the character defenses which it disrupts.

It is also assumed that the loss of the breast is in itself the focus of the entire experience. Our observations have indicated that for some women the surgical experience has much greater inherent threat, whereas for others it may be the "emptiness" in the axilla. For example, many women have said, "It wouldn't be so bad if they simply removed my breast, but why did they have to leave this hole." This preoccupation is so pronounced in some that they express the feeling that their bodies feel distorted and crooked.

Understanding Support Needed

We believe that the psychological experience of a radical mastectomy patient consists of a sequence of interrelated events: first, the anticipation of the injury and interference with adaptation; second, the actual injury; third, the reparative efforts to restore the adaptation which the patient had achieved prior to the experience.

The fact that mastectomy surgery for breast cancer is a terrifying experience bears continual emphasis. It realistically threatens life and has a major impact upon the functioning individual. The mastectomy patient has many problems from the very moment she first recognizes the symptom. If continued psychological invalidism is to be avoided, understanding support must be introduced as soon as the diagnosis is established.

Frequently, women cannot vent their feelings of despair or resentment to the surgeon for fear of rejection and projected retaliation. If the diagnosis is established in a clinic, a routine referral should be made to a psychiatrically trained worker. As much time as necessary should be spent with the patient at this time to encourage her to express her fears and to give her support in dealing with them. Once this contact is made, the patient has the feeling that there is someone in the hospital who is friendly and understanding. This relationship has considerable importance since some patients have stated that it helps to see a familiar face on the day of admission. A continued relationship with a supportive person is necessary in meeting this stressful situation.

Postoperative expressions of dependence or anger are also often given negative interpretation by hospital personnel. Here again, the trained worker can give valuable assistance. Mastectomy patients have been through a trying experience, and dependence is the cry for support in the initial postoperative stages. The goal should not be to break dependency as soon as possible because for most women it is only a temporary phase. Feelings of anger and resentment should be allowed expression since they are usually positive signs. A psychiatrically trained worker will be able to detect when and if dependent or hostile expressions are becoming fixed patterns of adaptation. This, however, occurs very infrequently.

The reparative effort often follows the following pattern after surgery. Most patients are very depressed for some period of time after surgery, whether for an hour or a week or longer. During the depressed period the feeling is usually, "I am doomed, life is over, nobody loves me." The next period is one of self-pity during which the patient is saying in effect, "If nobody cares for me, I'll care for

myself." Self-pity is usually accompanied by feelings of misgiving and guilt and at this time the psychiatrically trained worker can help the patient by assuring her that there is nothing wrong with feeling sorry for oneself. Successful resolution of these feelings results in resumption of functioning and interest in the environment.

We must be entirely realistic in appreciating the terrifying nature of surgical experiences, particularly when an organ of great psychic significance is involved. Radical mastectomy patients need warm support and understanding if they are to meet the threat of the situation. If this support can be routinely forthcoming to all patients, many women will be spared intense emotional reactions and limitations in living. The radical mastectomy patient can live a full life after cancer surgery but only if we accept our obligation to aid in the process of reducing trauma and restoring function.

Employment of the Physically Handicapped

The Federal-State employment services report the placement of 2,400,000 physically handicapped workers in nonagricultural employment from January 1, 1940, to July 1, 1952. Additional hundreds of thousands of workers with disabilities found employment through other sources.

These cumulative figures, cited by the President's Committee on Employment of the Physically Handicapped in connection with the eighth observance of National Employ the Physically Handicapped Week, which took place October 5 through 11, are indicative of the progress that has been made in placing persons with disabilities into productive employment. The task, however, is a continuing one. It is estimated that another 2 million men and women can be added to the labor force if rehabilitation services are made available to them, according to a report made by a special Task Force on the Handicapped to the Office of Defense Mobilization.

The Veterans Employment Service reports that, in spite of favorable labor market conditions and a record of 124,000 disabled veterans placed in 1951, 40,500 disabled veterans were looking for work in April 1952. An additional 50,000 disabled veterans are taking training or schooling under vocational programs sponsored by the Veterans Administration and will be looking for jobs in the near future.

Additional figures indicative of the success of the efforts in behalf of the physically handicapped and of the work yet to be done come from the Office of Vocational Rehabilitation. During fiscal 1951, the local offices of State divisions of vocational rehabilitation rehabilitated into employment nearly 67,000 men and women. Another 150,000 are receiving services which eventually will enable them to work, about 75,000 of whom will be ready within the next year.

These 67,000 men and women who overcame helplessness in 1951 added more than 100 million man-hours to the Nation's productive effort, according to the Office of Vocational Rehabilitation. They increased their earnings from $16 million to $116 million a year.

A breakdown of these 1951 figures indicates that 5,696 of the physically handicapped who found employment had hearing disabilities. About 1,500 were deaf and 4,200 were hard of hearing. These 5,696 people increased their earnings from $2,300,000 a year to more than $10,000,000 the first year, an increase of 344 percent.

Methodology of a Family Health Study

By CHARLOTTE F. MULLER, Ph.D., ANNE WAYBUR, A.B., and E. RICHARD WEINERMAN, M.D., M.P.H.

The family health study conducted in 1949 at the University of California represents an experimental effort to design a method of investigation useful in getting accurate and complete information on morbidity and medical care among families.

At the outset, the complexity of factors defining health status was recognized. The objective was set of designing techniques that would embrace the full array of health experiences and would permit the correlation of complicated data on family and personal characteristics, illness, disability, preventive and therapeutic services, and expenditures for medical care.

Previous studies of health experience in the population provide a background for all fresh attempts (*1*). Many of their techniques and findings were utilized in the development of the experimental method presented here. Past studies, however, often were based upon single interview samples, used complicated schedules, or were restricted to certain aspects of the family health complex.

A new method is sought—one that will minimize dependence upon remote memory, will establish continuous relations between survey sample and research team, and will provide a means of recording and correlating many kinds of interdependent health information.

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Important changes in science and society, which have affected illness and health care, demand new approaches to research in health. Revolutionary clinical advances, new trends in the organization of medical and hospital service, new statistical techniques—all have appeared since the last comprehensive health surveys in the 1930's. Up-to-date information about illness—its incidence and prevalence, the medical needs it creates, the effect upon family economic status—is needed in order to formulate, revise, and administer health programs.

In the family health study, the opportunity existed to test some new techniques and to collect comprehensive data on health experience among a special sample of urban families. This report describes the study population and, in some detail, the methods under trial. It does not present the statistical findings, which will provide a more definitive basis for evaluation of the survey techniques.

The Population Sample

The study grew out of a health survey conducted in October 1948 by graduate students at the University of California School of Public Health, among employees of the university at Berkeley. In order to compare different techniques, the 4,800 employees were divided into several random samples. One sample, consisting of 815 employees, was surveyed by personal interview and each person was asked whether he would be willing to keep a daily health record for his family in a later study.

Losses from the study sample can be divided into two groups: those occurring before the actual beginning of the study and those occurring

during the study. Table 1 summarizes all changes.

Of the original 815 employees, 160 were not available for the initial interview; 592 (or 90 percent of those actually interviewed) agreed to participate; 63 refused. The problem of sample losses due to employment turnover was a major factor from the very beginning. Sixty-four employees left the university before the initial interview was held in October 1948, and 28 left between the initial interview and the start of the study in April 1949.

Thus, 564 employees and 797 members of their families constituted the starting study population of 1,361 individuals. Over the 5 months of the project 60 employees and 72 family members were lost and 37 family members were gained, giving a final total of 1,266. Fifty-seven of these 60 employees and their 60 dependents were lost through termination of employment; 3 went on leave of absence; death claimed one family member; and changes in family composition accounted for 11. No one who actually started the study refused to complete it, although a few did not cooperate fully.

Characteristics of the study population were compared with available data for the United States, the West, the urban United States and West, and the San Francisco-Oakland metropolitan area.

In general, the study population may be characterized as a relatively young, married, employed, white-collar, urban group with more females, younger children, and larger incomes than the general population. Its social characteristics were potentially favorable to good health and adequate medical care, but the high proportion of women in the child-bearing ages and young children could be expected to increase medical needs.

Table 1. Changes in study sample, October 1948–August 1949

Changes	Employees	
	Number	Percent
Total original random sample, October 1948	*815*	*100*
Unavailable for interview [1]	160	20
Unwilling to participate	63	8
Willing to participate	*592*	*72*
Left university before start of study	28	3
Sample at start of study, Apr. 1, 1949	*564*	*69*
Left university during study	60	7
Sample at end of study, Aug. 31, 1949	*504*	*62*

[1] Includes 64 employees who left the university before the interview.

Methods and Materials

The main features of the experimental method were a specially designed family health record booklet, regular monthly interviews by a trained interviewer, and an integrated inquiry into morbidity, receipt of health services, and health expenditures. The booklet was designed to be used at home by the family for daily recording of health experiences, and the periodic interviews with the employee-respondent were held at work. The booklet, however, was kept at work by a number of employees to avoid forgetting to bring it from home on the day of the interview. This practice, of course, interfered with daily recording, but the complication was hard to avoid since the interviews were scheduled at work.

Family Health Record Booklet

The design of the family health record booklet presented some difficult problems. The record had to include all aspects of family illness and medical care. It had to be simple, orderly, and free from a confusing array of complicated items. It had to encourage complete recording and precision as to dates and dollar values. While language was kept as simple as possible, simplicity often conflicted with precision and adaptability. To some extent, verbal explanations were necessary to mediate between these objectives.

The booklet, entitled "Health Record—Day by Day," was attractively printed. A calendar was provided on the inside front cover for convenience in recording dates of health events. Different page colors were used to identify the various sections of the booklet. The first page presented simple instructions and definitions. A plastic loose-leaf binding permitted withdrawal, insertion, and rearrangement of pages in the event of family changes. The booklet was offered as a permanent possession to the

family, the statistical data being transcribed monthly by the interviewer.

Section I, "Family List," was devoted to an initial recording of demographic and social data on each family member—age, sex, relation to head of family, marital status, employment, and health insurance coverage. It was decided not to request income data until the final interview. At that time a separate schedule was completed, which included information as to the existence of a "personal" or "family" physician as related to the family's length of residence in the community.

Section II, "General Health Problems," was devoted to the recording of all underlying illnesses and impairments. Careful memory prodding by the interviewers helped to bring to light the host of chronic complaints, dental and visual defects, partial incapacities, and general health deficiencies so often omitted from health inventories.

Section III, "Health Insurance Coverage," took up an entire page. Although the complexity of public and voluntary medical care plans presented a difficult recording task, efforts were made to obtain data on the name of the plan, duration of coverage, premium costs, and type of benefit for each family member.

Section IV, "Record of Immunizations," comprised the fourth page. Data on past immunizations were collected only for children under 10 years of age. (Current immunizations were recorded for all family members on the monthly record sheet.) A special effort was made to find out where and by whom the immunization was performed, in order to ascertain relative roles of the health department and the practicing physician.

These four sections were filled in during the first visit, with the help of the interviewer. The subsequent sections were designed for daily recording of current health events and were reviewed monthly by the interviewer.

Section V, "Daily Record of Illnesses, Injuries or Disabilities, and of Services Received," was in many ways the heart of the record. Each family member had a separate page for each survey month. Under the proper date, check marks in appropriate boxes indicated days ill, days disabled, and days on which different kinds of home, office, clinic, or hospital care were received. Space was provided for diagnosis or nature of symptoms for each episode. Every effort was made to relate morbidity to service received. Preventive, diagnostic, and therapeutic procedures were identified under the heading "Reasons for Visits."

Much discussion preceded the design of the recording method for duration of illness and of disability. The problem of illness without definite disability was handled by checking separately days of symptomatology and days of at least partial interference with usual activity. In this way, both the subjective designation of illness and the objective experience of disability could be recorded. (See also p. 1154 for discussion of illness and disability.)

Section VI was a "Monthly Record of Expenses for Health Services." One page was used for all family expenditures for health goods and services, since one source of payment for all family members is common and bills for the family are often not itemized. This record included professional fees, hospital charges, money spent for drugs and supplies, laboratory and X-ray costs, and health plan premiums. There were three columns: bills received, individual cash payments, and total cash payments in the month.

Section VII, "Monthly Expenses for Persons Not on Family List," was designed to obtain data on health expenses incurred for institutionalized relatives and others not in the household.

Monthly Interviews

The monthly interviews, which provided a regular contact between the research staff and the study population, were conducted by two female interviewers especially trained for this project. They both participated in preparing material for the study and organizing the data for statistical analysis.

The interviews were designed to serve many functions. Through them the respondent was to be thoroughly informed and instructed concerning the conduct of the study. Close rapport was to be established with him through repeated visits by the same person. Recordings for the previous month were to be reviewed and corrected; questions were to be asked to elicit

further recall and encourage maximum use of the daily record sheets. The chief operational purpose of the interview was to transfer the booklet data onto transcription forms for later analysis.

The interviewer avoided the questionnaire approach, presenting herself instead as a "consultant" who was available for assistance. Because of the variety of data requested, many cross checks on completeness and accuracy were possible. Discussion led by the interviewer was a vital adjunct to the booklet.

At the first monthly interview, general demographic and health information was collected, terms used and the method of record-keeping were reexplained, and health events already recorded were transcribed. At the final (sixth) interview, the entire booklet was checked against the transcribed record, inconsistencies and omissions were remedied where possible, and, in particular, chronic health problems and expenses were reviewed for completeness.

Preliminary Activities

A preliminary dittoed draft of the booklet was pretested and modified before the booklet was printed. The study was initiated by sending an introductory letter to each person who had agreed to participate. The letter described the booklet, reviewed the objectives of the study, and explained the role of the interviewer.

A visit was then made to each employee participant, during which a sample booklet was shown and the recording method explained in detail. This initial visit also served to confirm and extend participation by a maximum number of the original sample. The best time and place for subsequent interviews was determined. A supplemental instruction sheet was felt to be desirable and was prepared to accompany the printed booklet. Through these visits, the final composition of the sample was ascertained. When the printed booklets were received, they were numbered, adapted to family size, and mailed out.

Quantitative Evaluation of Methodology

Losses from the original employee sample were sizable, numbering 311 out of 815. Of these, 251 left before the study actually began. As previously indicated, sample losses were due primarily to changes in employment status and normal changes in family composition. Relatively few of the original random sample expressed unwillingness to participate, and none dropped out for this reason during the survey. Nevertheless, the employees who did not complete the study, plus their family members, constituted a significant sample loss.

The possibility must be considered, therefore, of bias in the health record resulting from sample losses, even though the original sample is not representative of the general population and the specific statistical findings have only local application.

An exact measure of the effect of these losses must await analysis of the ultimate findings. Meanwhile, the possible bias was estimated in two ways: (*a*) by comparing employees who completed the study with those who did not, in terms of their morbidity rates as shown in

Table 2. Adequacy of recording in family health record booklet, monthly average, April–August 1949

Adequacy of reporting	Number	Percent of all respondents	Percent of those reporting data
Respondents completing study [1]	500	100. 0	
Respondents with data to report	405	81. 0	100. 0
Data completely recorded	169	33. 8	41. 7
Data partially recorded	120	24. 0	29. 6
Data not recorded	109	21. 8	27. 0
Recording of data not scored	7	1. 4	1. 7
Respondents with no data to report	95	19. 0	

[1] Excludes four respondents in families in which another family member was also a respondent and took primary responsibility for maintaining the record.

Table 3. Adequacy of recording in family health record booklet, by month, April–August 1949

Adequacy of reporting	Monthly average	April	May	June	July	August
Number of respondents reporting data [1]	405	418	425	410	391	381
Percent of these with:						
Data completely recorded	41.7	45.7	43.1	38.3	39.1	42.0
Data partially recorded	29.6	32.5	26.8	32.7	28.6	26.9
Subtotal	71.3	78.2	69.9	71.0	67.7	68.9
Data not recorded	27.0	21.1	27.8	27.8	30.0	29.0
Recording of data not scored	1.7	.7	2.3	1.2	2.3	2.1

[1] Includes only those completing study.

the previous student survey, and (*b*) by tracing changes in the age, sex, and marital status distribution of employees remaining over the course of the study to see if the character of the original sample was altered. Unfortunately, data on family dependents were not available in the earlier student survey; therefore, full sample comparisons were not possible.

In the first analysis, three indexes of previous health status were compared: (*a*) acute disabling illness during the month of the student survey, (*b*) chronic conditions not disabling in that month, and (*c*) so-called "health gripes" (conditions causing "irritation or discomfort"). All findings were expressed as percentages of the group in question reporting such conditions. Of these indexes, it was only the first—disabling illness—for which a significant difference was found between employees who completed and those who did not complete the family health study. Nineteen percent of the "completed" group reported disabling illness during the month, as contrasted with 26 percent of those who dropped out. This difference could have arisen by chance less than twice in 100 trials, if both groups came from a population homogeneous as to risk of illness.

Sample losses might thus have resulted in an apparent reduction in the risk of acute disabling illness where no such reduction had actually occurred.

In the second analysis, study of changes in key characteristics of the employee group revealed significant change only as to age, when beginning and end dates were compared. The percentage of employees under 25 years of age dropped from 14.5 percent to 9.1 percent during the course of the project. It is inferred from findings of the National Health Survey on the relation between age and disability (*2*) that such a shift could increase the risk of acute illness, thus tending somewhat to offset the influence of the finding in the first analysis.

The reason for leaving the study was not significantly related to health status at the time of the prior survey. No significant differences were found among those who left the study for various "objective" or "subjective" reasons, or at different times.

Test of Completeness of Information

A test was performed to see if the repeated interviews used in the study were an especially useful method of securing completeness of data on the existence of long-standing chronic disorders. Findings on pre-existing cardiovascular-renal disease as reported at successive interviews were analyzed. Of the 87 conditions in this diagnostic group, 86 percent were reported at the first interview and 14 percent at one of the five later interviews. Among the 14 percent not mentioned at the first interview were some serious and potentially expensive cases (e. g., rheumatic heart disease). The rapport built up through continuous relations with respondents and the recall value of probe questions by interviewers are felt to have aided in stimulating more complete disclosure of chronic conditions as the study progressed.

Adequacy of Record-Keeping

Completeness of recording in the special health booklet was evaluated to ascertain (*a*) whether the recording form, as disinguished

from the repeated interviews, contributed substantially to collection of data, and (*b*) what circumstances influenced the degree to which the booklet was used.

Completeness could, of course, be checked only against data provided to the interviewer in the booklet or verbally, not against events never disclosed. Each booklet was roughly graded at each visit as having complete, partial, or no recording for the preceding month. If the respondent saved assorted jottings and bills for the interviewer, a "partial" grade was given.

Of 500 employees graded, a monthly average of 81.0 percent had some data to report. Of those reporting data, 41.7 percent entered all of the information in the booklet, 29.6 percent recorded incompletely, and 27.0 percent made no entries at all (table 2). Language difficulties, fear of spoiling the book, and, in some cases, indifference were found as reasons for not recording data, but many of the nonrecorders referred to the order of items in the booklet in making verbal reports.

Factors considered as possible influences on the adequacy of record-keeping were statistically analyzed. The results were as follows:

1. There was no clear-cut relationship between adequacy of recording and willingness to keep the health record when originally approached. Differences in adequacy among those who originally agreed, refused (some who refused the student interviewer were willing to participate when revisited by a survey staff member), or were not contacted until the spring of 1949 were not statistically significant. They could have occurred by chance alone in more than 70 out of 100 trials. Apparently once the employee decided to participate, his original attitude did not decisively influence the adequacy of his recording.

2. Record-keeping declined slightly during the course of the study (table 3). The changes are statistically significant, since they could have arisen by chance alone in less than 5 out of 100 trials. They reflect, at least in part, the difficult period of summer vacations. An upward swing was discernible in the month of September when vacations were over and when final, and especially comprehensive interviews were given.

3. Professional, clerical, and skilled workers recorded more adequately than service and unskilled workers. Variations in adequacy among occupational groups, shown in table 4, could have occurred by chance alone in less than 2 out of 100 trials.

The main problems were the sustaining of active participation over time and the securing of adequate written records from different occupational groups.

Qualitative Appraisal of the Method

The following qualitative appraisal of the methods used in the family health study is presented as a supplement to the statistical evaluation. It is based upon the personal experience of the interviewers.

Family Health Record Booklet

In general, the family health record booklet served its primary purposes well. The significant advantages of the booklet appeared to be the following:

1. Its comprehensive array of designated health items stimulated a fairly complete reporting of family health experiences, even when separate jottings rather than the booklet pages were used.

2. Its daily check-mark system favored the regular recording of current events and aided memory.

3. The attractive design and the offer of the booklet as a permanent family possession encouraged respondents to use it. Other practical uses for the booklet, such as a record for tax purposes, for family budgeting, and for medical reports to the physician, were also discovered.

4. Its scope of information made possible a meaningful approach to family health, since social factors, previous health status, morbidity rates, medical services received, and expenses incurred could all be correlated.

Among the definitions of terms used in the study, those for "illness" and "disability" were the most difficult to apply uniformly. The statement in the booklet limited "illness" to conditions at least partially disabling, that is, producing "pain or discomfort severe enough to interfere, at least in part, with the performance of usual activities, at home, at work, or at school." But the frequent receipt of medical

care for nondisabling conditions and the pursuit of "usual" activities (at least, work) while clinically ill were grounds for broadening the concept. In the final interpretation, explained verbally to the respondents, all nondisabling current health disturbances, all days spent as a hospital patient and at home following discharge, and illnesses disabling during part of their course were included as illness. By checking "yes" or "no" to the question, "Performed usual activities?" days of disabling illness were recorded separately from days of nondisabling illness. Thus disabling, nondisabling, and total morbidity could be tabulated. Individual interpretations, especially regarding preschool children and convalescent periods, remained, of course, to impair uniformity of findings.

The definition of "family" was also important, because it influenced the selection of persons included in the study. A unit based on related persons dwelling together was adopted. This was modified in a number of cases where related adults (other than couples) in the same household maintained independent ways of life.

The Interview Method

Successive visits by the same person were useful in building up rapport with respondents and in filling in gaps in information. But some employees did not welcome interviews, feeling that they could keep the record adequately without aid and that they could not spare the time.

Interviewing on the campus was economical of personnel time, both in travel and in the interview itself. Most employees were reasonably certain to be at their jobs at the scheduled time. It is possible that some who permitted this type of interview would have opposed household visits. But in many situations, a home visit might have contributed to more relaxation, privacy, and full attention. A few home visits were made when circumstances required.

Contact with family members, particularly the housewife, would have secured more complete information, at least in some cases. This was not feasible within the limits of this study.

Dramatic occurrences, such as injuries and hospital experiences, were more clearly recalled than minor episodes of illness, routine health services, and details such as exact duration of an illness. In other instances, the obstacle to collection of complete data was unwillingness to disclose family situations, primarily marriage and pregnancy. A few such cases came to light when the critical period in personal life was over and the respondent volunteered information. There may have been other cases where the data were lost.

Summary and Conclusions

1. The family health study of the University of California was designed to assay a method of collecting information on the full complex of health experience, with less dependence on memory than in interview studies and with

Table 4. Adequacy of recording in family health record booklet, monthly average, by occupational status

Adequacy of recording	All occupations	Professional, managerial, official	Semiprofessional	Clerical and sales	Skilled, semiskilled	Service, agricultural, unskilled
Number of respondents reporting data [1]	405	186	89	65	27	38
Percent of these with:						
Data completely recorded	41.7	44.7	47.2	40.0	44.4	15.8
Data partially recorded	29.6	31.7	24.7	32.3	26.0	31.6
Subtotal	71.3	76.4	71.9	72.3	70.4	47.4
Data not recorded	27.0	22.0	25.9	26.2	29.6	52.6
Recording of data not scored	1.7	1.6	2.2	1.5	0.0	0.0

[1] Includes only those completing study.

maximum correlation of interdependent items. A specially designed booklet kept by the family and monthly visits to the employee by trained interviewers were features of the method.

2. Five hundred and four employees of the University of California and 752 family members were studied for 5 months in 1949. This group had its origin in a random sample of 815 employees. Seventy-two percent of the original sample (or 90 percent of those actually interviewed) agreed to participate. Twenty percent of this group left the university before the study. Sample losses during the study amounted to 11 percent of the employees and 5 percent of the family members. No losses during the study were due to refusals to continue.

3. The study population was atypical; the relatively high proportions of young persons, females, small families, skilled occupations, and high incomes have special implications for health and medical care experience.

4. Evidence on possible bias through sample losses indicates that acute but not chronic illness findings would be affected. Health status did not appear to be a significant reason for leaving the study.

5. Efficacy of repeated interviews in study of chronic disease was tested by analysis of the delay in reporting cardiovascular-renal disease. Though few, the cases discovered in later visits included serious types of disorders.

6. Completeness of individual record-keeping was evaluated. Of respondents with some health event to report, 41.7 percent recorded all data, 29.6 percent recorded some, and 27 percent recorded nothing. Adequacy of record-keeping had no statistical relation to original willingness to participate, declined slightly over the 5 months, and was greatest among professional and clerical groups.

7. Qualitative appraisal of the booklet and of the interview technique, based on the interviewers' experience, reveals that the booklet, despite defects in design and terminology, helped to organize information for the respondent and to secure comprehensive data. The multiple-interview procedure stimulated interest, established rapport, and promoted accurate and complete recording.

* * *

Detailed tabulations not included in this summary report and a limited number of the family health record booklets are available from the School of Public Health, University of California, Berkeley. Data from the student survey, some of which were used for purposes of methodological evaluation of the family health study, have not yet been prepared for publication.

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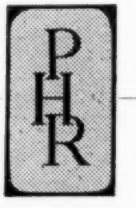

Hospitals Today

By ANTHONY J. J. ROURKE, M.D.

There are more hospitals today than ever before. They are better staffed and better equipped. They are serving many more patients. Their service is vastly improved. The vision and energy of their governing and administrative authorities are moving hospitals forward with the times. In short, hospitals are doing a much better job than they did just a few years ago.

Hospital administrators can take just pride in their part in this achievement. Approval of these efforts is reflected in public appreciation of good hospital care and respectful recognition of it by the professional groups working in hospitals. The years of life saved for thousands of patients is our reward for having built hospital care to its pinnacle of excellence in the history of man.

Hospitals today are facing critical challenges which I am confident will be met with vision and vigor. Let us consider the many complex problems related to economic, managerial, medical and social changes which must be solved by all hospitals across this Nation. In addition there are the innumerable day-by-day intricacies of hospital operation which need attention. These challenges seem formidable. They point toward a need for even more foresight, leadership, initiative, and untiring effort in the future than has been demonstrated in the past. What is the unfinished work ahead?

Dr. Rourke, executive director of the Hospital Council of Greater New York, retired as president of the American Hospital Association at its 54th annual meeting in Philadelphia, September 15–18, 1952. His was the opening address.

The Cost of Care

Because economic factors thread through all hospital administration, it is logical to consider them in their broad aspects, but first as they affect the patient's purse.

Hospital care is expensive. The high level of service demanded by the public has resulted in greater cost. This increase—although compensated somewhat by a reduction in the length of time a patient remains in a hospital for treatment—outruns the advance in the cost of living that can be attributed to the depreciation of the value of the dollar. Hospitals are seriously concerned with this higher cost and have taken aggressive action to explore its basis with the hope of finding ways to control it.

The cost of hospitalization does not affect just a few individuals. The current demand for hospital care is the greatest ever attained in hospital history. The statistical study of hospital operating data conducted annually by the American Hospital Association indicates that during the past year 6,832 hospitals operated 1½ million patient beds; 18¾ million patients were admitted; and almost 3 million babies were born in the hospitals. There were 1,075,000 people employed in hospitals. The physical plant of these hospitals represented an investment of 8¼ billion dollars; total operating expenses amounted to almost 4 billion dollars.

From these general statistics, one can see how the hospital touches the economic life of a large segment of the population each year.

Voluntary Prepayment Plans

To help meet the economic problem of patients, hospitals have assisted in the development of voluntary hospitalization insurance

plans, a system of prepayment for hospital care. We can be proud of the enrollment of 42 million people in these programs.

Although voluntary prepayment solves the problem of financing hospital care for many individuals, there are still large numbers of people who cannot now be covered by prepayment plans and who are unable to meet the cost of high-quality care. These people are the indigent and those who experience catastrophic illness. Financing the cost of hospital care in the event of poliomyelitis, tuberculosis, or mental disorder, to mention but a few illnesses, is a catastrophe to any family, even when covered by most prepayment plans.

As a supplement to their income from patient service, hospitals receive substantial financial support through charitable contributions. In many instances, these contributions have meant the difference between high- and low-quality care. In others, they have been the deciding factor between some care and no care. Gifts of philanthropists have made possible special studies in hospital administration and organization, and research into this phase of hospital care has been financed largely from this source. So far, however, such financing has barely begun the broad studies which should be undertaken.

While the average voluntary hospital is blessed with community support, it rarely has sufficient financial resources to undertake significant research that might affect nation-wide hospital operation. Research is usually applied only to a local situation. The individual hospital is seldom able to disseminate its findings to the general hospital field so that patients of other hospitals will benefit. The scope of study and research is perforce limited almost always by financial considerations.

The solutions of the economic problems of patients and hospitals have moved beyond the resources and responsibilities of the individual hospital. Now needed are coordinated action and a rededication to the common purpose by all hospitals. Some means must be found whereby all hospitals can benefit from the hospital studies undertaken throughout the entire country.

The ultimate success of inquiries into more effective and more economically produced care must be based upon a search for new methods of administration by all hospitals. Progress will depend on an orderly study procedure and wide dissemination of findings. It will require cooperation.

Problems of Management

What are the more perplexing management problems? It has been frequently said that hospital administration requires all the skills of industrial management in addition to the special facility to deal with professional groups, the understanding necessary to maintain good relations with a special clientele, and the organizational ability to keep the hospital functioning 24 hours a day, 365 days each year. Ours is a tremendous assignment. It is one which tests the best in all of us.

The complexity of hospital management sometimes opens it to criticism and censure—frequently by people who are not completely informed. Yet, hospital administrators, as guardians of the public health, by accepting their assignments, have implied a willingness to assume responsibility for the best possible performance. Improvement of hospital administration is a part of that responsibility.

Hospitals have, on occasion, been suspected of lagging behind industry in the acceptance and use of modern business practices. Some management engineers believe that only 10 percent of business is efficiently administered. If this is true, it cannot be denied that some hospitals, too, are not operated at peak efficiency.

The average hospital has as many as 26 special departments encompassing no less than 185 different jobs. The average industry entails only 65 or 70 different jobs. This comparison points up the complexity of the administrative tasks in hospitals. Determination of ways to coordinate hospital specialists into an efficient unit to work with medical scientists in serving the best interests of patients is another task.

However, it should be remembered that the administration of a hospital differs greatly from that of general industry and requires different methods of operation. Many of these methods have not been critically explored. Little is known about the most effective way of solving many of the complex problems of hospi-

tal operation. A broad inquiry into administrative procedures is overdue in the hospital field.

The hospital product is service, and it is provided through the efforts of people. The high quality of health care required by the public demands competency and a full supply of trained persons. Unfortunately, these persons are not available today, either in the quality or quantity needed. Recent studies of special departmental functions pointed up large deficiencies between supply and demand of personnel. Such shortages create special management problems which need solution.

The Administrator

The hospital administrator must develop a thorough understanding of the hospital field by familiarizing himself with national and local programs. He must have knowledge of specific skills in all the technical phases of hospital activity. He must organize in-service training courses for hospital technicians. He must integrate the special skills of hospital personnel into a working organization. The administrator must have the broad knowledge of human relations which comes from assurance in job knowledge, from training in administration, and from ability to inspire and motivate people to work together.

Coupled with these specific responsibilities of administration is the broad responsibility of the hospital governing boards for policy and standards. Questions and decisions of policy which relate to legal and financial matters and quality of care pose problems which are peculiar to hospitals. The administrator must bring to members of the board all the information they need so that both they and he may provide an effective community service. Many problems of board authority and relationship as yet are unsolved. Greater efforts must be organized to help hospital board members understand and resolve the numerous issues for which they carry major responsibility.

Interdependence With Medicine

During the past 25 years, impressive advances have been made in the field of medical sciences. With this progress has come an increasing interdependence of physicians and hospitals. And as research has been conducted, as inquiries have been extended, as investigations have been advanced, this interdependence has increased proportionally. The end result has been the creation of a relationship inextricably binding hospitals and medicine together.

The interdependence of the physician and the hospital has created many problems. The hospital is straining to cope with the myriad complexities arising from the application of the advances in medicine. In many hospitals, particularly those in rural communities, the introduction of the most advanced medical techniques developed during this supersonic age is performed under what are virtually horse and buggy managerial circumstances. The results, although seldom disastrous, can be said to handicap the efficiency of the team working to produce high-quality health care.

The rapid development of new medical methods in recent years has taxed the ingenuity of hospital administration. The hospital must meet scientific advances through changes in its physical plant, in equipment, and in procedures, and through the development of new personnel skills. Some delay in making these changes is inevitable. The time lag cannot be lengthened—it must be shortened.

To focus on serving the health needs of the community and to act in partnership with the physician, hospitals need men of leadership and training in the most progressive managerial skills. Hospitals must keep pace administratively with the technical progress of the medical sciences.

Also, hospitals need national coordination through an experimental and investigative service to develop techniques and to disseminate information promptly to bring to all physicians, hospitals, and patients the full benefits of medical progress.

Challenge of Social Changes

Hospitals must plan to meet the needs of a growing population. They must initiate programs of care for increasing numbers of aged persons. They must expand their facilities to permit greater service as community health centers. They must inaugurate more effective preventive health care programs.

Population increase, the lengthened life span, concentration of life-saving services, and emphasis on prevention of illness are all phenomena of the virile society in which we live. All introduce problems. All will complicate administration. None can be ignored.

Today we observe this expanding horizon of hospital responsibilities. Today we must plan to meet them so that by tomorrow they can be added to programs of public service. More study, more research, more experimentation, and extended education will be required to accomplish our objectives with dispatch and success.

Future Progress

It is apparent that hospitals all over the country reflect the achievements which are possible when members of a community band together. Voluntary hospitals which are primarily managed by governing boards whose members have volunteered services in interest of the public illustrate one notable accomplishment of free enterprise.

The extension of services and the increased use of hospital facilities will add to economic problems of patients and hospitals alike, requiring special study and development of improvement and extension of prepayment plans for the purchase of care and more efficient methods of production and distribution of care.

Emphasis on management engineering will dictate the need for top administrative skill, for more highly trained personnel, and for improved operational patterns.

Continued advances in medical science will require greater knowledge of medical administration, strengthened relationships between hospitals and physicians, and emphasis on the development of new techniques for applying medical knowledge.

Social changes will open new vistas of hospital service.

As large and as overwhelming as is the job ahead, we can take courage and new faith as we review the progress of the past. The path to the goals of the future must be built upon a system of research and an orderly collection of information about the varied facets of hospital administration. Future objectives can only be obtained by a hospital-action program which applies new administrative procedures, cooperatively developed and disseminated through intensive research and education but focused on better care of the sick.

Atkins to India, Board to Sanitation Post

C. H. Atkins, chief of the Division of Sanitation, Public Health Service, since 1948, has been assigned as chief sanitary engineer of the Public Health Mission to India under the Point IV program, Technical Cooperation Administration. The new assignment also carries the duties of assistant chief of the mission, chief sanitary engineer of the Government of India, and visiting professor of sanitary engineering at the All-India Hygiene Institute.

Succeeding Mr. Atkins as chief of the Division of Sanitation is Leonard M. Board, assistant chief since 1948. Mr. Board, a commissioned officer in the Service since 1943, received his master of public health degree from the University of Michigan. He is a fellow of the American Public Health Association, a past chairman of the Conference of Municipal Public Health Engineers, and a member of the Conference of State Sanitary Engineers, and of the American Society of Civil Engineers.

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